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Geographical Society,
Bombay.
THE PRESENT OF
Premchand Raichand Esq.
5th. January 1865.

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ACCOUNT

OF

KOONAWUR,

IN THE

HIMALAYA,

ETC. ETC. ETC.

105833

BY THE LATE

CAPT. ALEXANDER GERARD.

EDITED BY

GEORGE LLOYD.

WITH A LARGE MAP.

LONDON:
JAMES MADDEN & Co.
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1841

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TO

W. B. BAYLEY, Esq.,

&c. &c. &c.

LATE

CHAIRMAN OF THE HONOURABLE COURT OF DIRECTORS

OF THE

EAST INDIA COMPANY,

THIS VOLUME,

THE WORK OF ONE OF THE MOST EMINENT OF THE COMPANY'S SURVEYORS,

IS

DEDICATED

BY

The Editor.

PREFACE.

More than a year has elapsed since "Major Sir W. Lloyd's and Capt. Alexander Gerard's Narratives," were published. The Volumes were nearly through the Press when Capt. Alexander Gerard died. Shortly after, his family placed all his papers at the disposal of my father and myself, in order that we might prepare what was valuable for the public. They have been carefully read, and out of the mass of Route Books, Observations, loose Memoranda, &c. the result is this Volume.

The following Extract from a letter to me from our lamented friend, explains the materials from which the Account of Koonawur was formed: "From my Narrative and Notes I afterwards made out an Account of Koonawur, of about 100 pages,

and if you would like to see it, I shall send it if I can get the copy I forwarded to my mother, which is for the present mislaid. It is a description of the country, without any narrative; so perhaps it would not interest you. It is very incomplete, and from the information I afterwards collected, I could with ease make it twice as long without diminishing the interest: at least, I think so."

We have not found any further materials to add to this Account of Koonawur amongst his papers, but the copy from which it has been printed was carefully corrected by the Author, which in some small degree compensates for them. The work as it is now, is full of information not only to the man of science but to the merchant and the general reader. Yet it is a sad reflection, to know that the result was obtained by the sacrifice of a life ardently devoted to the pursuit of science.

The Map which accompanies this Volume was also constructed by Capt. Alexander Gerard, and is a reduction from one on a much larger scale in the possession of his family, which is a production worthy of his indefatigable zeal.

The two Narratives of his first Journeys in the Himalaya, are added in order to complete the series.

The Journal of 1817 is compiled from his Route Book. The other of 1818, he had himself written out fairly.

In 1817 he was accompanied by Dr. Govan during part of the route, and in 1818 throughout by his brother, the late Dr. J. G. Gerard, who was another sacrifice in the cause of geographical science.

The Appendix consists of several very valuable Tables of Latitudes, Barometrical Observations, and a short one of the Limits of Trees in the Himalaya. The latter was complete, but the two former were on a variety of loose sheets, and were arranged by my father; an office for which he was perfectly competent, having been a Surveyor of the East India Company for many years.

What has already been published in the two former Volumes above-named, together with what is contained in this, completes all Capt. Alexander Gerard's Observations and Journeys in the Himalaya.

The task has been undertaken neither with a view to profit nor fame, but from the sincerest motives of rescuing and preserving in a series, the valuable Observations of one of the most enterprising of British Travellers, and one of the kindest of Friends. The praise bestowed upon the three

Brothers by an eminent Foreigner is at once correct and deserved, and it is a pleasing duty to conclude with it.

"Die drei Gebrüder Gerard und ihre Begleiter
" sind es, welche von hier, auf die wahrhaft kühnste
" und unermüdetste Weise in mehrmal wiederholten
" wissenschaftlichen Expeditionen, seit dem Jahre
" 1818, bis in die neueste Zeit (1829), allen Gefah-
" ren der wildesten Hochgebirge und der furchtbar-
" sten, polaren Winterkälte Trotz boten, um ihre
" Höhenmessungen, Ortsbeobachtungen bis zu den
" äussersten Riesenhöhen zu verfolgen, und durch
" alle Gebirgs-Pässe und Plateau-Wüsten hindurch,
" über die Chinesischen Grenz-Pikets hinaus, wel-
" che dort die Britischen Provinzen wachsam um-
" stellen, in die Nachbar-Provinzen vorzudringen."

Ritter. Die Erdkunde von Asien, B. 2. s. 546.

G. LLOYD.

Brynestyn,
August 10, 1841.

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AN ACCOUNT

OF

KOONAWUR.

BOOK I.

AN ACCOUNT

OF

KOONAWUR.

REMARKS UPON THE LOWER PARTS.

BOUNDARIES.

KOONAWUR, called likewise Koorpa, is the tract of country belonging to Busehur, which lies on both banks of the Sutluj, from lat. 31° 15′ to 32° 4′, and from long. 77° 50′ to 78° 50′. It runs in a N. E. and S. W. direction, and the habitable part seldom exceeds eight miles in breadth. It is a secluded region, rugged and mountainous in an extraordinary degree. It is terminated on the North and N. W. by mountains covered with perpetual snow, from 18,000 to 20,000 feet above the level of the sea, which separate it from Ludak, a large extent of country running along the banks of the Indus, from the vicinity of Garoo to the limits of Kashmer. A similar range of the Himalaya, almost equal in height, bounds it to the South; on the East it is divided from the elevated plains of Chinese Tartary by a lofty ridge, through which are several high

passes; and on the West lies Dusow, one of the divisions of Busehur.

EXTENT.

The area of Koonawur, reckoned from the crest of the snowy range, which is its natural barrier, as nearly as could be determined by fixing the most prominent peaks, and crossing the Himalaya by some of the passes, appears to be about 2100 square miles, but this point will probably never be very accurately ascertained from the unsurmountable obstacles that occur at every step.

DIVISIONS.

Koonawur has seven large divisions termed Khoond, each of which contains three or four lesser portions named Ghoree, comprehending a few villages; many of the latter consist of five or six distinct parts, and the houses of the principal residents have names which are common to their owners, and indeed are more frequently used, especially in their foreign intercourse, than their own names: in this respect they resemble the Scotch Lairds, who are generally best known by the name of their estates.

POPULATION.

I have pretty good data for estimating the number of inhabitants, because there are but few villages I have not visited, and the population is so scanty that almost every body can tell how many houses his village contains, and most people know the number in their own district. I generally enquired the population of each village from three or four

separate persons, and the greatest difference, even in the largest, comprehending eighty or ninety houses, was rarely two or three.

The number of inhabitants to a house was only ascertained in a few places, but the mean of these in various parts of Koonawur gives six, which will not appear too many, since Polyandry, or a plurality of husbands, prevails.*

The lamas and nuns who profess celibacy, have of course been reckoned singly.

The following Table shews the divisions of Koonawur, together with the area of each district and number of inhabitants.

STATEMENT OF THE AREA AND POPULATION.

Large Divisions. AREA IN SQUARE MILES.		*Small Divisions—Population.*		
1 Hungrung ..... Tartars.	288	1 Nako ..... 330 2 Chango ... 378 3 Hango 348	....	1056
2 Shooung or Shooe...	475	1 Gungel .... 988 2 Soomchoo .. 959 3 Zhungram .. 750 4 Yooshooung. 798	....	3495
3 Tookpa	977	1 Sgeenam .. 1030 2 Reedung .. 576 3 Tangling .. 444 4 Kumroo ... 780	....	2830
4 Rasgramee	131	1 Oorlee .... 300 2 Purlee 486	....	786
Carry over..	1871		8167	8167

* Polyandry also exists in Chinese Tartary and in the hilly tracts towards the plains. Besides this drawback on the increase of the population, there is another peculiar to Chinese Tartary and the adjoining countries; that is, celibacy, which is professed by numbers of the inhabitants: and in some villages the monks and nuns form almost half the population.

	Brought forward..	1871			8167	8167
5	Wangpo	61		Wangpo ...	330	330
6	Utharabees	87	1	Buree	186	
			2	Nalche	162	
			3	Grosnam ..	312	
			4	Trade	276	936
7	Pundrabees	86	1	Roopee	162	
			2	Kambe	258	420
	Square miles..	2105		Population...		9,853

The above gives a remarkably small number of inhabitants in comparison to the extent of country,* there being scarcely 4$\frac{3}{4}$ to a square mile, but this is not to be wondered at, as by far the greatest part of Koonawur is occupied by vast chains of snowy mountains, inaccessible crags, or impenetrable forests. Koonawur was formerly under the dominion of a number of petty Chiefs, of whom there was almost one in each small district, till they were reduced under the authority of one person about 800 years ago.

FACE OF THE COUNTRY.

Koonawur is inhabited only on the banks of the Sutluj and other large streams, and the villages, which are from 7,000 to 12,000 feet above the sea, are thinly scattered; seldom more than two or three

* Koonawur, and especially Chinese Tartary, can never be populous countries; not, as it is generally supposed, that the Tartars are averse to agriculture; for as far as I have observed, this is by no means the case, as I have usually seen every spot capable of cultivation, even four or five miles from a village, under tillage. It is to the nature of the country and climate that we must look for the want of culture, and not to the inhabitants. I have frequently travelled between forty and fifty miles at a time without seeing a single spot fit for the plough, and further inwards, where the ground is more elevated, the unarable tracts extend to a much greater distance.

occur in a stage, and sometimes none at all for several days. With the exception of the upper parts, it is well wooded, and the most common trees are pines, and oaks of various kinds, and birches; the two first grow at all elevations from the bed of the Sutluj, 5,000, to the height of 12,000 feet, after that they become stunted, and in the form of bushes are rarely met with at 13,000 feet. Dwarf birches commence at 10,500, and in a few places attain the height of 14,000 feet. The face of the country presents deep-worn valleys, confining rapid streams, divided by precipitous mountains of amazing height, most usually veiled in everlasting snow.

MOUNTAINS.

The highest mountain ridges visible from any part of Koonawur run nearly N. W. and S. E. or parallel to the outer chain of the Himalaya, which, notwithstanding its imposing appearance when viewed from the plains of India, is in this quarter but a low range, comparatively speaking.

The most elevated chain I have seen is the great one that stretches along the left bank of the Indus. I observed it from a spot upwards of 14,800 feet above the level of the sea, whence it had an altitude of 1° 2′, and the guides that accompanied me, all of whom had often visited Ludak, assured me that it was distant eleven or twelve days' journey, and lay beyond the source of the Paratee river, and separated its head from the valley of the Indus or Singe Choo. This agrees very well with the map I constructed some time ago from information, in

which it is laid down eighty-four English miles from my station.

One-fifteenth of the intercepted arc is probably too much for terrestrial refraction in so rarefied an atmosphere, but it matters little whether one-tenth or one-twentieth be allowed, as the height of this range will come out 27,000 feet. This at best is but a rude approximation, but its vast elevation may be inferred from another circumstance, namely, its being so entirely covered with snow in August and October, that not a particle of rock was distinguishable with a Dollond's achromatic telescope, magnifying forty times, and it will be afterwards noticed that in these Intra-Himalayan regions, snow melts at heights above 20,000 feet. It was by no means a solitary point I saw, but on the contrary, an extent of thirty or thirty-five miles, all having a similar appearance, and subtending almost the same angle. The range on the right bank of the Indus is said to be equal in height, but although I have seen numerous people who have travelled along the course of that river, I never yet fell in with a person who had crossed that ridge in a North-eastern direction.

From Keoobrung Pass upwards of 18,300 feet, I had a view of part of the range that runs along the left bank of the Eekung Choo river, (the Garoo branch of the Indus,) and is a continuation of the lofty one before mentioned. The theodolite shewed an elevation of two or three minutes, and as the distance is about ninety miles, its altitude will be upwards of 23,000 feet. It was this chain that Mr. Moorcroft crossed between Daba and Garoo, and I

must have almost seen the peaks on each side of the pass, since the bearing of the point I observed cuts Mr. Moorcroft's route in the highest spot, and my informants stated that a projection of this very ridge which is crossed again between Garoo and Mansurowur, forms the Kylas, or Kangree mountain, situate to the Northward of that sacred lake. It is, therefore, highly probable that these two passes are 19,000 feet at least, if we may judge from analogy, since the peaks that flank the most elevated pass I visited are not 2,500 feet above the crest, and although I have crossed seventeen passes between 15,000 and 19,000 feet high, I have seen no break in the range so much as 3,000 feet lower than the peaks on each side, unless that which gives passage to the Sutluj. It is, however, possible that in some places the ridges may be depressed 4,000, 5,000, and 6,000 feet below the general altitude; but Captain Webb mentions a pass through the outer Himalaya 18,871 feet, and I can scarcely suppose those to the Northward are inferior to it.

From the elevated ridge on the left bank of the Indus, which is separated from the outer Himalaya by the deep valley of the Sutluj, chains of lofty summits branch off in a S.W. or Southern direction. Those that I have remarked are the Paralasa and Purgeool, which are both said to join it, and it can hardly be otherwise, since there are no valleys between the Indus and Sutluj that run N. W. and S. E. in this quarter of the hills.* The Paralasa,

* Mr. Fraser says, that beyond the outer Himalayan chain the mountains decline in elevation. This is not confirmed by experience, but, on the contrary, they increase in altitude at least as far North as I travelled,

from a spot 18,600 feet, had an altitude of 13′ at a distance of about fifty miles, which will give 21,000 feet; and two points of the Purgeool have been very correctly measured from many stations, and found to be 22,630 and 22,488 feet. The highest station my brother James and I reached on the Purgeool, was fully 19,400 feet, and there the rocks were granite, so the others are probably of the same formation.

In mentioning that the highest mountain ridges run N.W. and S.E. I only speak of what I have seen, for I think it possible they are only subordinate ranges which shoot out from a great central chain, that most probably extends from N.E. to S.W. I, however, know nothing of geology, so I speak from conjecture alone, and from what seems to me likely to be the case. My reason for supposing a great central ridge, is, that the famous Kylas Mountain, or a continuation of it, throws off the waters of the two largest and most celebrated rivers of India in opposite directions, that is, the Indus which runs N. W. as far as the capital of Ludak, and the Burrampooter which flows nearly S.E. It is, therefore, here we may expect to find the most elevated land, unless we suppose the Kylas range to be inferior in altitude to the ridges that branch off from it, which question can, per-

to lat. 32° 5′ 30″. In this quarter of the hills, that is, N. W. of the Tons, the average height of the outer passes is from 15,000 to 16,000 feet, and the space without villages from eighteen to twenty-four miles. The second range, which I crossed to Speetee, was much higher than the first; the pass was upwards of 18,600 feet, and the space without villages above forty miles. Gangtung and Keoobrung Passes are each 18,300 feet, and the distances without villages are five stages, or forty miles.

haps, be satisfactorily discussed by geologists. People constantly travel from the sources of the Indus and Burrampooter to Ludak and Teshoo Loomboo, but I have not seen any person who went farther beyond Kylas than merely making its circuit, so we shall probably remain long in the dark respecting the country that lies to the N.E. of Mansurowur. The general character of the mountains is very similar, the North-western face being invariably rugged, and commonly well clothed with wood, whilst the contrary one is more gently sloped, not so well supplied with timber, and affords rich pasturage: this is particularly the case in the lateral valleys that run from N.N.E. and N.E. to S.S.W. and S.W., and branch off from the Sutluj and Buspa rivers. They have all the same character, which is very strongly marked. The North-western* sides of the mountains are remarkably precipitous, and present bold cliffs of a thousand varied forms, and the opposite ones are gradual acclivities often covered with turf. In that part of the dell of the Sutluj which lies N. E. and S. W. this difference is not so perceptible as the strata are inclined to the E. and E.N.E., or nearly in the direction of the course of the river.

In the valleys that run N.W. and S. E. it is difficult at least for an inexperienced person to decide which face is most rugged, as they both seem equally precipitous, and in those glens the crags on either side often subtend an angle of 60 or 70 degrees.

* Mr. Frazer also remarks that the North-western faces of the mountains are more rugged than the opposite.

The composition of the mountains is chiefly granite, gniess and mica slate, with a few pieces of quartz and felspar, and now and then some crystallized quartz, or a crop of rock crystals; there are likewise many other varieties of stone with which I am unacquainted, and towards the confines of Ludak and Chinese Tartary the mountains are blue or marled limestone.

In the outer Himalayan range, which is formed mostly of gneiss and mica slate, and in some places of pure mica, the direction of the strata is most easily distinguished; it is about N.E. and S.W. and the inclination is to the S.E. or E.S.E. making an angle of 10 or 20 degrees with the horizon; here the dip seldom exceeds 30°, and the summits form a series of inclined plains, but farther to the Northward, where the rocks are granite, the inclination, which is still to the Eastward, is from 60° to 70°, or even more, and the mountains end in acute points and have a bristled aspect; this is singularly exemplified in the alpine group of Ruldung, where there is one peak 21,000 feet surrounded by many others of inferior elevation, shooting into black slender spires or needles, uncommonly barren and nearly destitute of snow.

VALLEYS.

The largest valley is that of the Sutluj, through which the river of the same name flows; its length within Koonawur, following the sinuosities of the stream, is about 80 miles, and its general direction is N.E. and S.W. The level space in the bottom is inconsiderable, being usually not much broader

than is sufficient for the passage of the river, the elevation of the bed of which is from 4,400 to 2,600 feet. The right bank or that face of the range exposed to the S. E. is for the most part very abrupt for the first 2,000 or 3,000 feet, with here and there level spots laid out into vineyards; at the height of from 7,000 to 9,000 feet are the villages, and arable land which extends to 10,000 or 11,000 feet, and is in general scattered in narrow slips interspersed with gloomy woods of oaks and pines. From this elevation upwards, the ground is covered with green sward and countless varieties of the loveliest flowers, of which thyme of many kinds is most plentiful; there are clumps of forest and beds of juniper here and there, but the inclination is gentle, and rocks are not so frequent as below. This belt forms the pasture lands, and here in summer shepherds tend their flocks. These verdant meadows reach to about 14,000 feet, and are crowned by mountains covered with eternal snow, or sterile peaked masses of granite.

The left bank of the river, which has a North-western aspect, contains more plain land near the stream, and the villages are commonly situate only a few hundred feet above it; here are extensive vineyards and thriving crops, diversified with orchards of apricots and apples. These arable spaces that occur only in distances of 6 or 8 miles, vary from a hundred yards to $\frac{1}{2}$ or $\frac{5}{8}$ of a mile in breadth, after which the mountains rise rapidly at an angle of 30° or 35°, and are extremely precipitous and sometimes thickly wooded with pines and birches. The forest belt on this side extends

fully 800 feet higher than on the other; but such is the crumbling nature of the granite in some parts, that prodigious masses every now and then give way with a horrid crash, overthrowing the trees and leaving nothing behind but a wreck of naked rocks, devoid of vegetation. The pasturage here is neither so abundant nor so luxuriant as on the right bank of the river. The limit of forest on this side is 12,500 or 13,000 feet, above which the gravelly granite soil seems unfavorable to the developement of plants or even grasses, which in small tufts reach to 1,000 feet higher. From 14,000 to 16,000 feet are barren crags terminated in tall steeple-formed points, too abrupt for snow to rest upon; and beyond these, tower the white summits of the stupendous Himalaya.

The scenery of this valley partakes more of magnificence than of beauty. Here every thing is on the grandest scale, fragments of fallen rocks of immense bulk, hurled from the peaks above, and vast impending cliffs fringed with dark forests, and topped with mountains of indestructible snow, appear on every side; a village perched amongst the crags without a single patch of verdure around, and now and then a more populous place environed by fields and orchards, or what is most common, a solitary house, with a small piece of cultivation or a few vineyards attached, but seldom attracts the eye of the observer. The character of the Sutluj is more of the nature of a torrent than that of a large river, for its fall in several places is 100 or 150 feet per mile, and it rushes over rocks with a clamorous noise, and exhibits heaps of white foam.

In some parts, however, the prospect is highly picturesque, for instance, in the vicinity of Reedung, where the ground for some miles is adorned with smiling fields and flourishing vineyards, and orchards of the finest apricots and apples. The bed of the Sutluj here is broad, variegated with islands of sand and pebbles, and divided into numerous serpentine channels. The height of Reedung is 8,000 feet, and in summer the temperature is so mild as not to indicate so great an altitude, and the traveller would never imagine he was so near the Himalaya, till when turning his eyes to the south, the illusion is at once dispelled, and he beholds the lofty Kylas or Ruldung peaks* rising in a wild assemblage of pointed summits at an angle of 30°, presenting an immense surface of snow, and forming an extraordinary contrast with the verdant scenery around. The nearest peak is 12,000 feet higher than the town, and not more than five miles distant in a direct line.

In other places, where the mountains are more barren, the arable lands seem like oases in the midst of a desert. One spot of this kind should not be forgotten; that is, the village of Khab, which in a tract of more than usual sterility, bursts suddenly upon the view, and the effect is heightened by its being concealed by a small ridge until you come within 200 yards of it, when the traveller is amazed at finding himself transported, as it were by magic, from horrid desolation into shady groves of apricots, and beauteous vineyards watered by copious rills.

* These must not be confounded with the other Kylas near Mansurowur. The people say this last is by far the highest, and the Reedung Kylas is only a piece of it, which was removed by the gods to please a very pious devotee, who lived opposite to Reedung on the right bank of the Sulutj.

What an agreeable relief this is to the wearied passenger, after a fatiguing journey of six miles over parched rocks, off which the scorching sunbeams are reflected with such dazzling brightness as to inflame the eye.

The places in this valley that deserve the names of towns, are Murung, containing eighty-seven, and Reedung, seventy-five families, upon the left bank of the Sutluj; and on the other side, are Kanum, of fifty-nine families, besides a monastery of thirty-four lamas and convent of twenty-five nuns. Lubrung, containing thirty-two houses, eight lamas and twenty-two nuns. Leedung, comprehending sixty-two, and Tholang, fifty-five families. These are amongst the most populous in Koonawur, and with the exception of Rampoor, the capital, where there are 110 houses, they are the largest places in Busehur; and indeed between the rivers Tons and Sutluj in an area of almost 6,000 square miles, excepting the capitals of some of the hill states, as Nahun of Sirmoor; Bilaspoor of Kuhloor; Soonee of Bhujee, and the Sik town of Makhowal, there are scarcely ten other villages of so great extent.

HUNGRUNG.

The valley of Hungrung is the next in importance with respect to size. Its length is about twenty miles, and it includes the lower part of the course of the Lee or Speetee river, which runs from North to South. This stream contains a great body of water, and the elevation of its bed is from 8,500 to 10,000 feet above the level of the sea; the lowest village is 9,200 and the highest is

12,000 feet, the rocks toward the river are mica slate, blue or marled limestone of a crumbling sort, broken granite, loamy protuberances and much decomposed felspar. The western face nearest the Spectee is most gently sloped, the soil being granite, gravel and pebbles imbedded in clay: the ground on this side consists of gradual risings without many rocky points, except where the valley joins the dell of the Sutluj, where it is excessively rugged; these swellings extend to 12,000 or 13,000 feet, above which there are granitic fragments of enormous size, piled upon one another in the wildest disorder, and terminating in sharp points and triangular peaks, of which the mighty Purgeool is the loftiest. The other face is precipitous for 2,000 or 3,000 feet, and sometimes almost overhangs the stream: farther up there is a good deal of reddish clay, whence to the summit is of easy access; this range is from 20,000 to 21,000 feet, and strange to say, in October it was devoid of snow.

The country is excessively arid, and but around the villages, where are some poplar and apricots, there is not a tree to be seen, the productions being short brown grass, patches of juniper, prickly bushes and aromatic plants. On the banks of the few rills there is turf, but not in any quantity.

With the exception of some narrow strips there are only five spots capable of culture; but these are larger than almost any others in Koonawur, and the fields which extend to about 13,000 feet, yield an abundant harvest. In the vicinity of

Hango 11,600 feet high, the mean of eight ears of Ooa (Hordeum cœleste) picked at random, was seventy-eight fold, and the grain was bulky and well filled.

The scenery is unvaried from the scarcity of wood, and there is little either to interest or please. A great want of moisture pervades the atmosphere, and in the latter end of October every particle of verdure is parched up by the dryness of the wind: the poplars and apricots are stripped of their foliage, and their bare trunks appear: at this season, the face of the country exhibits a picture of sterility not easy to be conceived, so very different from the ever green forests of the lower tracts. The ground is too elevated for vineyards, and apricots do not thrive at the highest places; each of the three villages that give name to the sub divisions, contains between twenty and thirty families, besides lamas and nuns. But the fort of Shealkhur, on the parallel of 32° is of some importance; it lies North and South and is above 300 feet long but very narrow. Inside are houses all round, leaving a small space in the centre. The walls are ill built of loose stones and unburnt bricks, but the site is rather commanding: on the East is the Speetee river, 400 feet lower, and the slope to it is 35°.

To the North and West there is a similar natural scarp to a rivulet which winds round it, and the Southern face is the only one of easy approach.

The valley of Hungrung should properly be included in the upper part of Koonawur, but as it is the only one in that quarter, I have noticed it here.

BUSPA.

This is the most romantic of the Himalayan valleys, and it is difficult to imagine a more beautiful spot. Its head is limited by snowy mountains of surprising height, through which lies the lofty Chungsakhago Pass; the upper part for about twenty-five miles, as far as Chetkool, the highest village, is bounded by barren and unwooded ranges, mostly covered with perpetual snow. The inhabited country then begins, and extends for twenty miles to the Sutluj. The bottom of the valley at Chetkool is 11,400 feet, and it decreases in elevation to 6,000 feet; proceeding from Chetkool six miles down to Rakcham, the breadth of the dell is from a quarter to half a mile, and the level space is often thickly clad with woods, impervious to the sun's rays. The chief trees are pines, willows, hazel, and sweet-briar; and the Buspa river, which gives name to the valley, rolls smoothly on pebbles with a gentle murmur, or rushes with rapidity in a narrow stream. The dell runs W. N. W. and E. S. E., and the face exposed to the S. W. is most rugged, and not so well wooded as the opposite one, where the birches rise almost to 13,500 feet. A little farther down is a pile of loose stones, which has descended from the surrounding heights, and must have choked up the bed of the river, which here tumbles over the embankment with furious violence and a thundering noise.

The valley soon regains its former character, and for six miles is often upwards of a mile in breadth.

It is neatly laid out in fields and gardens, of peas, beans, and turnips, abundantly supplied with water by numerous canals, and studded with rural cottages and villages. There are many shady avenues of apricots, and widely spreading walnuts, which form dark arbours, and afford a cool retreat. The Buspa river glides gently along in an expanded bed of sand and pebbles, which it divides into islands overgrown with barberries and willows.

The verdant cultivation, and numberless groves and bowers of fruit trees, are strongly contrasted with the rugged rocks on either hand, which present naked and impracticable crags, frowning in the most terrific forms, or now and then scantily wooded with a few stunted pines.

Just behind the town of Sungla, which has a fine appearance, and is built upon a slope, with the houses rising above each other, is seen the immense Ruldung Cluster, at an elevation of 29', and streaked with snow, which reminds the spectator he is in the vicinity of the colossal Himalaya.

The people have a vague tradition that this valley was once a sheet of water, and from the breadth, flatness of surface, and quantity of soil, it has the appearance of it, for the lower part of the course of the river is very narrow and abrupt, and the Buspa seems to have cut a passage through the mountains, which on each side are similar in every respect, and the strata have the same inclination.

Towards the Sutluj the character of the dell is quite altered, the river rushes with the impetuosity of a torrent, imbound by mural ramparts, or uncom-

monly bold cliffs, shaded by pine forests of luxuriant growth; here the villages are few in number, and are situated high above the stream.

The vine has often been planted, but does not thrive, owing to the periodical rains, which are partially felt in this valley, destroying the fruit before it comes to maturity.

The chief place of note is Sungla, containing about fifty families, the great mart for traders from Gurhwal and Chooara. Grain of all kinds, and articles from the plains, are the imports, and salt from Chinese Tartary is almost the only export. Formerly wool was taken to Gurhwal, but since the British government has begun to purchase it, the Koonawurees find it more profitable to carry it to Rampoor.

Kumroo, comprehending upwards of forty families, is of some consequence; there is a fort situated on a perpendicular rock, and a Deota, named Budreenath, one of the greatest in Busehur. The temple is said to be very magnificent, and is crowned with a ball of pure gold weighing fifteen or twenty pounds.

TEEDOONG.

This is without exception the most rugged glen I have seen; its length, from the the Sutluj as far up as it is capable of cultivation, is fourteen miles, and the highest village, Charung, must be nearly 12,000 feet; I did not visit it, but stopped at another place nearly two miles lower down, which was 11,700 feet. In all there are three villages, none of which are large. The cultivation is poor, in very small

patches, and for twelve miles the cliffs on either side subtend an angle of 60° or 70°, and menace the traveller with destruction; they rise in the most hideous shapes, and are really frightful to behold; they are generally naked, but here and there a few dwarf pines, mountain ashes, gooseberries and juniper bushes find a scanty nourishment.

The rocks are hollowed out into innumerable caves, some of them capable of conveniently sheltering fifty or sixty people; and the river, whose fall is 300 feet per mile, breaks on the scattered fragments with a deafening noise, reverberated tenfold from the surrounding caverns.

DARBOONG.

This valley runs N. W. and S. E., and is only inhabited for eight miles; the upper part is uniformly craggy on both sides. The Darboong river has its source amongst the vast fields of snow near the Manerung Pass, and it rapidly swells in its descent to Ropa; there is little wood thus far, the trees being stunted pines and birches, which last here attain the immense elevation of 14,000 feet. The rocks are almost all blue and marled limestone, and quartz, and contain a good deal of copper ore. Some of the mines were formerly productive, but they have lately been abandoned, from there being nobody here that understands the business.

This dell comprises the district of Gungel, in which there are six villages, besides many hamlets. It is bounded on the N. E. and S. W. by ranges almost 15,000 feet in height; and for four or five miles it presents an entire sheet of rich cultivation,

diversified by bowers of apples, and apricots, and thriving vineyards, which in this valley flourish at 9,500 feet, and are watered by abundant placid streams.

The town of Soongnum contains seventy-one families, a convent of thirty-two nuns, and several lamas; the situation is charming, and the vines, fruit trees, and gardens, have a fine effect; peaks of 17,000 and 18,000 feet without snow, are visible at no great distance, and notwithstanding the altitude of Soongnum, the summer temperature is 70° of Fahrenheit.

The above are the principal valleys, and some of the others are, the Taglakhar, Hocho, Pejur, Kozhang, Mulgoon, Yoola, and Wungur. With the exception of the last, none of the rest contain more than a single village, and they are too unimportant to deserve particular notice, being almost wholly uncultivated. They are overhung by dark woods near the Sutluj; but farther up there are rich grazing lands covered with flocks.

The dell of the Wungur includes the district of Wangpo, containing seven paltry villages. A very rapid torrent rushes through it, and near its union with the Sutluj it forms a succession of waterfalls, and dashes against the huge rocks in its bed with a noise like thunder, throwing the spray in sparkling showers to an astonishing height.

The small lateral valleys are numerous, and it is in them one finds the greatest variety of beautiful scenery. The prospects are not so grand as in the deeper glens, but they are much more diversified, and there is not such a degree of sameness for so great a space. On one side are shady copses and

deep forests of evergreens, overtopped by bare crags ending in snowy summits, and now and then you meet with a mural precipice of several hundred feet, over which a cataract discharges its spangled stream.

On the other side again, the woods are not so thick, and the ground presents a carpet, embellished with many sorts of lovely wild flowers, of the most gaudy tints and delightful fragrance; this place is famed for the excellence of pasture, and here are browsing numerous herds of cattle.

The rivulets in these valleys have just as varied an appearance; in one place the torrent leaps from rock to rock in a series of cascades, or where the declivity is more gentle, it expands into sheets of limpid water, and now and then passes under dark vaults, whose lower surfaces are formed of thousands of sparkling icicles, of various forms, clear as rock crystal, from which showers are constantly dripping.

RIVERS.

The principal river in Koonawur is the Sutluj, which flows through it from one end to the other; the chief branch, or that which has the longest course, issues from Rawun Rudd Lake, better known by the name of Lanka, or Langa-Cho, the last word meaning a sheet of water. It runs within the Himalaya mountains for 280 miles, and the first part of its course is nearly W. N. W. for 200 miles, to clear the heads of the Ganges and its tributary streams; it then enters Koonawur, and winds considerably, generally in a South-western direction, but it often runs due South, and near

where it leaves the Himalaya, its coûrse is West for a long way. Within Koonawur its length is about eighty miles, after which it still flows W. S. W. for 160 more through the hills, and before it enters the plains it makes several bold sweeps, and penetrates the low sandstone range at Roopoor. It washes the hill towns of Rampoor, Bilaspoor, and Makhowal, and its course from Roopoor to its junction with the Beah or Beas, at Hurreeke Puttun, twelve miles above Ferozpoor, is about 130 miles in a south-westerly direction. Its whole length thus far, is 570 miles, 440 of which lie within the mountains.

The late Lieutenant McCartney, to whom geographers are greatly indebted for much valuable information contained in the map annexed to Mr. Elphinstone's Caubul, was the first person to put us right regarding the Indus, which he ascertained ran past the capital of Ludak, and Roodok, a place of some note, famed for its lakes of salt and borax, half way between Leh and Garoo. Mr. Moorcroft subsequently found out that the stream which issues from Rawun Rudd is the Sutluj, and the one that washes Garoo or Gartop, which my informants call Eekung-Choo, is a branch of the Indus; and all this agrees exactly with my enquiries. European geographers, until very lately, brought both the Sutluj and Indus into the Ganges, which they made to wind among snowy mountains for 700 or 800 miles; and this they seem to have done without a sufficient reason, since the Hindoos always asserted its springs were at the foot of the Himalaya range.

Major Rennell says the river that runs from Lan-

ken, that is Lanka, Lake of Du Halde, is named Lanktshou,* or by Dr. Gilchrist's way of spelling, Lankchoo or Langchoo, for k and g are interchanged. Now this is little different from what the Sutluj is called in Chinese Tartary, that is Langzhing-Choo or Langzhing-Khampa. I could not ascertain the meaning of zhing, but it appears to have nothing to do with the name of the river, for the Indus is named Singe-Choo, or Singzhing-Choo, as well as Singzhing-Khampa, and the last word means river.

According to Tiefenthaler, the stream that runs from Mansurowur to the West, is the Satlouj, (Sutluj,) which passes near Chaparang (Chubrung). This, however, he (Tiefenthaler) discredits, and Major Rennell adds, "very justly."† This opinion must have

* Major Rennell thinks that the Lamas, who knew the source of the Bramapootra, were mistaken about the river that flows from Lanka Lake to the westward, which they call Langchoo, but had the Lamas been followed in their latitudes as well as in their names of rivers, our maps of India (with the exception of Arrowsmith's late one,) would have been much more correct than they are.

† I traced the Pubur from the snow near its source, where it was but a few feet broad and three inches deep; five miles further down, after it had received numerous rills, it was about twenty feet broad, and unfordable; seven miles farther, it was upwards of thirty feet in breadth. Here it was joined by a stream of equal size, and at this point the turbulence and thundering noise of the torrents clashing together, is beyond description. This was in the month of June, before the commencement of the periodical rains, and as the three large branches of the Ganges, the Baugeerutee, Junnubee, and Alukmondra, wind a considerable way amongst the Himalaya, they have a great many feeders which, united to the other streams (many of which are very considerable) that join the Ganges lower down, make a great addition to it, so that at Hurdwar it is of a good size, although not to be compared with the Sarda. I may add, that the Gogra, where it unites with the Ganges, near Chupra, contains by far the greatest body of water, although the latter river has been joined by the Jumna, and many other large streams, as may be seen by the maps.

The Gorkhas all say that the Kurnalee, a branch of the Gogra or Sarda, is by far the largest river within the hills that is crossed between Nepaul and the Punjab, not even excepting the Sutluj.

been founded upon the seeming impossibility of the Ganges increasing so much in size before it enters the plains, were its source on the southern-western face of the Himalaya: and I must own that, to a person who has not visited the snowy mountains, nor seen the rapid augmentation of the rivers that rise amongst liquid snow, this seems natural enough. Yet some degree of dependence might still have been placed on the authority of the natives, especially as they insisted that the Ganges issued from the south-western foot of the Himalaya, and that the river from Mansurowur, was a different one, and called Langchoo, or Sutluj, which was represented as having a very long course, as is actually the case.

In the map of the Lamas sent by Emperor Camhi of China, to explore the sources of the Ganges, Mansurowur is placed in lat. 29° 30′. M. D'Anville removed it to 32°; Major Rennell has got it in 33° 15′, which, he says, "may serve to shew how vague a performance the Lamas' map is, which errs 3° 30′ in latitude." M. Anquetil Du Perron has placed it so high as 36°, which is still wider from the truth, for its lat., according to Capt. Hearsey, who visited it, is only 30° 50′, and Capt. Webb brings it down to 30° 23′, which last is certainly nearest the truth. Major Rennell mentions that Lassa, or Lahassa, is a full degree too low on the Lamas' map;* but this, after

* The Lamas have certainly got Hurdwar 2° too low, and nearly 2° too far east; but it does not appear that they visited that place, and I rather think they did not. The long. of Mapang, in Rennell's map, which I suppose must have been taken from that of the Lamas, is very near the truth, which, if it is reckoned all the way from Pekin, is highly creditable to them, and shews that they must have paid particular attention to the bearings and nature of the country. It also proves that they wished to give the truth.

all, does not appear a very great error, considering the imperfection of instruments so long ago as 1712, for even in the present day we find mistakes of more than half that quantity nearer home, notwithstanding the great modern improvements in constructing and dividing astronomical instruments. For instance, Baron De Humboldt informs us, that in the map published by Jeffereys in 1794, Mexico is 37′ wrong in latitude; and in Arrowsmith's beautiful large one of the West Indies, it is 32′ too far north; and I may notice that in a later publication, Ree's Cyclopædia, it is twenty-eight miles false. If the error in the latitude of Lahassa be allowed for farther up, Mansurowur, according to the Lamas, will be no more than seven miles wrong in latitude, compared with Lahassa. It is not easy to form an estimate of the quantity of water contained in the Sutluj, for although the breadth can be determined, yet within the mountains there is scarcely a possibility of sounding it, on account of its great rapidity. The following are some of the breadths, taken at the narrowest places where there are bridges:

Suzum, under Numgea. . . .	74 feet.
Namptoo, below Pooba . . .	106
Wangtoo, rope bridge	92
Rampoor	211
Kheksoo	145

But I have found it in other parts 150 yards across.

At Phulour Ghat, in the plains between Loodheeana and Lahour, where I crossed the Sutluj in the cold season of 1811 and 1812, I estimated the

breadth 250 yards; and the greatest depth, measured with a stick, was seven feet, and the current moderate. This will not, perhaps, be thought to accord with such a length of course, but it may be remarked, that, in winter, most of the streams that join it in Koonawur are arrested by frost, and the Sutluj itself is even frozen for 200 miles during two months at least.

In the rainy season, a more correct idea of its size cannot be formed in any place I have seen without the hills, for all the inlets, of which there are a good number, are full, and the country for miles is inundated by the overflowing of the river.

In Koonawur, the water of the Sutluj is always more or less discoloured by a number of very minute particles of shining sand suspended in the stream, which I believe Mr. Forster mentions to be the case, when he crossed the Indus, twenty miles above the fort of Attock.

The Sutluj is far largest and most turbid in June, July, and August, in which months the snow dissolves in the greatest quantity.

I have seen more than one hundred people who have travelled up the Sutluj, not exactly to its source, but to within ten or twelve miles of it, to the place whence the road turns off to Mansurowur. All the accounts agree that the largest stream issues from the western corner of Rawun Rudd, or Langa, and even close to that lake, it is stated to be thirty feet broad and one-and-a-quarter deep, in the dry season, and very rapid. By the time it reaches Thooling or Ling, eighty or ninety miles farther

down, it is so vastly increased by numberless rivulets, that it is reckoned too broad to admit of a rope bridge, and there is one of iron chains across it; a mile or so below which, it is said to be 120 yards broad and 1½ feet deep, when lowest. Here it is fordable in April, September, and October, and might be also passed in March and November, were it not encumbered with large masses of floating ice. It is said, the velocity of the current is such, that it can scarcely be stemmed if the depth be above two feet, unless upon yaks; this shews that the declivity of the land must be great, and, indeed, Captain Hearsey told me, that under Daba it certainly runs seven or eight miles per hour.

The names of this river are as various as the countries it flows through. In Chinese Tartary it is called Langzhing-Khampa: the first word is probably derived from the Lake out of which it issues; and the latter, in the Tartar language, means river. It retains this appellation for 200 miles, and near Numgea its usual name is Muksung, signifying river, or great river; lower down, Sampoo, Sangpoo, and Sanpo, of the same meaning, are applied. At a sandy place below Murung, where gold dust is sometimes found in small quantities, it is commonly Zung-Tee; the first word means gold, and the latter water. In the lower parts of Koonawur, its only appellation is Sumudrung, or the river. Near the capital of Busehur it is called Sutroodra, or Sutoodra; by which it is likewise known as far down as its union with the Beah: but its common name thereabouts is Sutluj or Sutlooj, which words, together with Sutroodra, are very often used by the

Koonawurees, even up to its source. About seven miles after the Sutluj enters Koonawur, it is joined by the Lee or Speetee, which is the broader; but in October it did not seem to contain near so much water as the other river. The Speetee is so hemmed in by perpendicular cliffs, that a traveller passing along the other side would scarcely perceive it, and the rocks that confine both the Sutluj and it, are equally abrupt for many hundred feet.

The contrast between the two rivers is remarkably fine; the Lee issues forth in a placid clear body of water, with a moderate current, whilst the Sutluj is muddy, and breaks violently upon the rocks with horrid din. The prodigious bulk of the impending crags strikes with terror the spectator who views them from below, and the clashing of the two streams, re-echoed by the surrounding caves, is stupefying in the extreme.

The rocks that flank the Speetee appear evidently to have been once continuous, but the period when the passage was opened must be very remote.

The whole of Hungrung which lies on the banks of this river, seems to have been under the action of water; and even at the height of 12,500 feet, the ground is covered with pebbles of granite, limestone, and mica slate, and round stones of many kinds embedded in clay. Here you meet with a succession of level spaces running parallel to the river, and descending in steps of some hundred feet, each apparently having been a former bed of the stream.

In the middle of August, I thought the Speetee contained fully as much water as the Sutluj. At the bridge under Shealkhur, where it is narrowest,

the breadth is ninety-two feet, but the average seems to be almost thrice as much; for I measured it in two places, 258 and 274 feet, which appeared to be the general width.

This river has five large branches: First, the Para* issuing from Chumorereel Lake, a beautiful sheet of clear water, eight or ten miles long and four or five broad, abounding with fish; it runs nearly from north to south for about sixty miles, and is then joined by the Zungcham, a large and rapid stream, from immense snow beds near Bootpoo on the E. N. E.; six or eight miles further down, it receives the Speetee river, formed of two principal branches, the most considerable of which still retains the name of Speetee, and flows through the district so called. It derives its source from the melting of the snow on the great Paralasa range, and the length of its course to the Para is eighty miles; in its way through the valley of Speetee, it receives a great accession to its waters by the addition of the Peenoo river from the S. W., about thirty-five miles in length, and having a great many heads. The character of these two branches is similar, and the dell of the Speetee seems to have been once a lake; the beds of each of these rivers, which are from 11,400 to 12,000 feet above the level of the sea, vary from half to one mile in breadth, and they are cut into numerous winding channels, studded with islands of sand and pebbles, producing barberries. I had no opportunity of seeing how much water the Speetee contains, as it can only be crossed by rope bridges

* Mr. Fraser thinks, that as the water of the Para is fresh, it does not issue from Chumorereel, but my informants state that it does.

in August, when I was there; but I observed people ford the Peenoo opposite my camp, and its passage was effected with considerable difficulty, by the largest yaks I ever saw: there were three streams, each above 100 feet broad, and two-and-a-half or three in depth, besides a number of smaller ones.

At the confluence of the Speetee and Para, the former river measured seventy-two, and the latter, which was most rapid, and contained the greatest body of water, ninety-eight feet in August last: there was no getting their depth at this time, but people who both crossed in the dry season, stated the Para to be two-and-a-half, and the Speetee two feet, but broadest.

A little farther down, the united stream is joined by the Chaladokpo, a very rapid mountain torrent from the E. S. E., which is twenty-five feet broad, and is probably between twenty and thirty miles in length.

After the union of these five streams, the course of the Lee, as it is then often called, is twenty miles more until it meets the Sutluj. Some of the other rivers that join the Sutluj have been mentioned under the valleys; but it may not be amiss, here, to notice the most considerable: the Taglakhar and Teedoong, are each about thirty-five miles in length, the Darboong is twenty-five, and the Buspa, which, in regard to size, is next to the Lee, is nearly forty-five miles; the Pejur may be fifteen or twenty, but I believe there is scarcely another in Koonawur more than ten miles long.

These last, however, frequently contain so much water, that in the hot weather they are seldom fordable four miles from their sources, unless in the

morning. I have often remarked this circumstance, which arises from the snow melting but partially during the night: I have seen torrents four feet deep, that could not be crossed in the evening, whilst next day at sun-rise they were scarcely two. The same occurs also in much larger rivers, as in the Jumna, which in the month of May I have found passable with difficulty on horseback sixty-five miles from its source, at four P. M., but at ten and eleven it was easily fordable: the people in the Dehra Doon, where I crossed it several times, are well aware of this, and seldom attempt it in the hot months after two or three in the evening.

The temperature of the rivers that rise amongst the snow, increases very regularly the farther they flow; when they leave the snow, the water is one or two degrees above the freezing point, and the temperature, conjoined to the fall, sometimes indicates the comparative length of their courses.

The following, which however could not be observed at the same time, show that the augmentation of temperature is pretty uniform.

Times.	Rivers.	No. of Stages from source.	Temp. of water Fahr.	Fall per mile by river.
October, 1818. Interval of 4 days.	Sutluj . .	26	56°	55 feet
	Buspa . .	5	48°.8	250
	Teedoong	4½	48°.8	300
	Taglakhar	4½	47°.3	350
An interval of 5 days.	Sutluj . .	19	50°.5	55
	Speetee .	8 or 9	41°	80
July, 1821. An interval of 5 days.	Buspa . .	4½	50°.3	250
		3	41°.5	
	Teedoong	4	49°.1	300
14 days later.	Taglakhar	3	43°.2	350
13th August.	Speetee .	9	48°.5	80
15th September.	Sutluj . .	28	56°.5	55

The temperature of the Sutluj does not show an increase corresponding to the distance of its source, proportionate to the other rivers; and it cannot be expected, since, before it arrives at Wangtoo, where the last observation was taken, it is cooled by the many streams that join it, of which the Speetee alone must make a very great difference.

In the above table, a stage may be taken at eight or nine miles in a direct line, and ten or eleven by the river. It is needless to be more exact, since the declivities of the streams are not strictly correct, as the distances between the two points where the barometer was observed, could not be accurately ascertained, unless when we travelled along their courses; at all events, however, the fall can scarcely be twenty or thirty feet wrong per mile, and this is near enough to show the regularity of the increment of the temperature. The declivity of the Sutluj and Speetee, has been nicely determined, from a great number of observations.

BRIDGES.

The torrents that descend from snow are generally very rapid, and are so quickly swelled by showers, that there is a bridge of some kind over almost every one.

The different sorts are:

1. Sango, or wooden bridge, of which there is a print given by Captain Turner. It is by far the neatest and best.

2. The Jhoola, or rope bridge, consists of five or six cables, formed of a sort of grass named Moonja. These are placed close together, and above is half a

hollow piece of fir tree, secured by pegs driven through below; from this hangs a loop of three or four ropes, which serves as a seat for passengers, and also as a receptacle for baggage. This block is pulled across by two pieces of twine, and the conveyance is pretty safe, but greatly alarming to a person unused to it, as the stream rushes with frightful rapidity beneath. The longest bridge of this kind I crossed was under Rampoor, where the river is 211 feet broad. At Wangtoo it is only ninety-two feet, but the velocity of the current is so great, that two of my servants, who once crossed it, were so afraid that they would not venture again, and preferred swimming over; one of them reached the opposite bank with difficulty, being completely exhausted, and the other was drowned.

3. Suzum, of which there is a bad one below Numgea, is formed of twigs very indifferently twisted; there are five or six cables for the feet to rest upon, and side ropes about four feet above the others, to hold by, connected with the lower ones by open wicker work or ribs, one or two feet apart. The side ropes are at a most inconvenient distance from each other; and in one place they are so far asunder, that a person cannot reach both with his extended arms. The ropes, from being constructed of such frail materials, do not bear much stretching, and the bridge forms a curve the sixth part of a circle. Frequent accidents have occurred here; and only a month before I crossed, in August last, two people were lost by one of the side ropes giving way. The guides that accompanied me did not tell me of this, until they saw ten or twelve of my

loaded followers upon the bridge at once. I was standing on the bank at this time, and the news of the accident spread with rapidity; and some of my people were so much alarmed, that they could neither move one way nor another, and stood trembling for a long time. Two, in greater terror than the rest, precipitated my tent into the Sutluj. This was the only accident.

Accidents also happen at the Jhoolas sometimes, for the block that traverses the ropes rubs them quickly, and they are not replaced until almost worn through.

4. Chukhzum, or chain bridge, likewise described by Captain Turner, is used where the rivers are broad. I never saw any of this sort; but there is one over the Sutluj, under Thooling. The first syllable signifies iron, and the last bridge.

The longest Sango I have noticed was 110 feet; and the utmost extent of this kind of bridge may be 130 or 140 feet. One hundred yards is probably quite enough for any Jhoola; and I should think the best Suzum of 100 feet, not altogether safe. The chain bridge may be almost of any length, for Father Georgi crossed the Burrampooter twenty-four miles S. W. of Lahassa, by one of 500 feet.

The above are used at large rivers, but there are various other wooden bridges, all called Sango, over the smaller streams. The most formidable I crossed, consisted of a single spar not a foot in breadth, thrown from rock to rock across a chasm ninety feet deep; two or three trees, with boards nailed across, are common; and now and then there is a round tree with notches, in an inclined position; but

the most usual is a couple of spars with bunches of twigs or slates across; some of these have a great slope to one side, and they are often slippery from being washed by the spray of the stream.

It would not require much money to build more durable bridges over the lesser torrents; some expense, which nobody likes to defray, would be incurred at first in constructing buttresses, but this would be the principal charge, since the finest timbers are found at most places.

Few of the small bridges have supports to raise them much above the water, so they are consequently carried away almost every year; some of them are swept down whenever there is a heavy fall of rain, and I have been detained four or five days, for want of a Sango across a stream not forty feet broad.

The only permanent bridges over the Sutluj, in Koonawur, at present, are Wangtoo and the Suzum under Numgea, which are situate upwards of eighty miles asunder. There was a good wooden one at Namptoo, between these two places, but it gave way in 1819 by the decay of the rock that supported it; and the communication between the villages of Dabling and Pooba, which are on opposite sides of the river, and not three miles distant by Namptoo, now makes a circuit of five days journey. The want of bridges is severely felt by the inhabitants, for when the river is swollen, it is often necessary to travel sixty or seventy miles to reach a village on the other side, which is only a mile or two distant in a direct line. A good Sango costs 500 or 600 rupees, but, notwithstanding the incon-

venience the people are put to, they will not subscribe this sum to rebuild the bridge at Namptoo.

When the river is low, temporary Sangos are erected at Reedung, and below Turanda, and there is occasionally a rope bridge at Pooaree.

Single people cross the Jhoola, at Wangtoo, by means of a forked stick which is made to traverse the cables; a slack rope is tied to the ends of the forks, forming a double that supports the person's back, which is bound round with a blanket, and he warps himself over with his hands and feet. This plan cannot be adopted by people with baggage, on which account a temporary bridge is made, in one of the most dangerous parts that can be imagined: it is formed of spars laid from one stone to another, at a place where there are several immense rocks in the bed of the river. These are so smooth, from being under water for some months, that almost every year two or three people slip off them and are carried down the stream, and never more heard of. There was a good wooden bridge here, but it was destroyed on the Goorkha invasion.

There are two Suzums on the Sutluj, near Shipke, and a wooden bridge, named Blupcha, twelve miles farther up.

In Hungrung there are two Sangos across the Lee; one under Shealkhur, ninety-two feet long, which is a very good one; and the other, twelve miles below it, called Leezam, which is much inclined to one side. There are two Suzums and a long rope bridge over the Speetee, in the district of the same name; there is a wooden bridge across the Para, fifteen miles above Shealkhur; and on the

Zungcham is a natural one formed of a wedge of rock.

I have seen four Sangos over the Buspa; the highest was near Chetkool, where the river measured sixty-six feet; but this bridge gave way a short time after I crossed it, and two persons were lost. It was lucky it did not fall when I was there, for there were between twenty and thirty people on it at once, and my followers had their loads so firmly tied on their backs, that they could never have got rid of them; so most of them must have been drowned, as the river was at its greatest height.

There are two Sangos close to Sungla, of seventy-seven and eighty-three feet, and one near the union of the Buspa with the Sutluj, forty-two feet long. The above are the principal bridges; there are many across the Teedoong and Taglakhar. I measured five, from twenty to forty-nine feet over the former; and four, from twenty-two to forty-three feet, on the latter.

ROADS.

From the rugged nature of the country, the greater part of the roads, however much pains may be bestowed upon them, can never be good for any length of time. Every year some places are destroyed by the falling of rocks, and it very frequently happens that the paths are so astonishingly rough, as to surprise the traveller how they could have been constructed with so small a population.*

* Mr. Fraser notices a descent of three miles at an angle of nearly forty-five degrees. People who have not instruments to determine vertical angles are very much deceived, and any one may convince himself of this, by

The roads in general consist of narrow foot-paths, skirting precipices, with often here and there rocks, that would seem to come down with a puff of wind, projecting over the head; to avoid which, it is necessary sometimes to bend yourself double. The way often leads over smooth stones steeply inclined to a frightful abyss, with small niches cut or worn, barely sufficient to admit the point of the foot; or it lies upon heaps of gigantic angular fragments of granite or gneiss, almost piercing the shoes, and piled upon one another in the most horrid disorder. Where the rocks are constantly hurled from above, there is not the slightest trace of a path, and cairns of stones are erected within

estimating the sun's altitude, and then observing it. An angle of 60° appears to be 70° or 80°, and I have seen an ascent near Mulown, which was reckoned 70°, but, on placing the theodolite, it turned out to be scarcely 30°. The greatest angle of the gun road, either at Jytuk or Mulown, is not above 37°, but most of the officers in camp estimated it between 60° and 70°. The steepest slope of a road that I ever saw, was 42°, and it was next to impracticable; and I should think 45° could neither be ascended nor descended without steps: for 30° even is difficult, and a snow bed of this inclination cannot be ascended unless the snow be furrowed or sink a few inches. Three miles at an angle of 45° give 11,000 feet perpendicular, which is incredible, and could not have been descended by Mr. Fraser near Bahilee, had he even gone to the bed of the Sutluj, which is there 3000 feet above the level of the sea; for he was not near so high as 14,000 feet. Besides, I know the place mentioned by him is travelled, both up and down, in one day, and I cannot conceive a person ascending 11,000 feet, at an angle of 45°, at once; 6,000 feet, at an inclination of 20°, is fatiguing, and it is what every body will not accomplish.

The most that my brother James and I ascended in one day, was about 7,000 feet; 8,000 might be performed with difficulty, but certainly not at an angle of 45°, so I think that Mr. Fraser's descent was not above 6000 feet, if so much. That the slope of the hill was 45° might be the case, but that cannot be what Mr. Fraser means, as it could give no idea of the angle, for I have ascended a mountain at an elevation of 55°, but the road took so many turns that the inclination was reduced to 25° or 30°; and a slope of 45° might be made so gradual by zig-zags, that the angle of the path would not be more than 15°.

sight of each other, to guide the traveller. There are often deep chasms between the rocks, and it requires a considerable degree of agility to clear them, and no small share of caution to avoid overturning the stones which now and then shake under you ; more than once, I have seen several of enormous size just upon the poise from our weight, and we were obliged to make a sudden and violent exertion to gain another, perhaps not more secure ; and it sometimes happened, that the one we had just quitted upset with a dreadful crash, from the impulse it received in our taking a leap to the next. Here and there beds of hard snow, inclined at an angle of thirty or thirty-five degrees, are met with, to ascend or pass along which, it is necessary to cut steps with a hatchet, and to descend them, the easiest and most expeditious mode is to slide down. The worst are the inclined rocks, and great slopes of hard gravel, and small stones rolling under the feet, to a deep and rapid stream ; some of these cannot be passed with shoes, and although I only took mine off at one place, yet I have often been obliged to grasp hold of a person's hand.

The most difficult part I saw, was where ropes were used to raise and lower the baggage, and this did not arise from the path having given way : now and then flights of stone steps occur, notched trees and spars from rock to rock, rude scaffolding along the perpendicular face of a mountain, formed of horizontal stakes driven into the crevices, with boards above, and the outer ends resting on trees or slanting posts, projecting from clefts of the rock below. The most extraordinary one of this kind I

ever saw, was in the valley of the Teedoong. It is called Rapeea, and the scaffolding continued for 150 feet. It was constructed like the other, with this difference, that six posts were driven horizontally into the cracks of the rocks, and secured by a great many wedges; there was no support on the outer side, and the river, which undermined it, rushed with incredible fury and a clamorous uproar beneath: the shaking of the scaffolding, together with the stupefying noise of the torrent, combined to give the traveller an uncertain idea of his safety

PASSES.

The passes from Koonawur through the outer Himalayan range, are fifteen in number; eight of these were determined last year by a Dollond's portable barometer, of the most improved construction, and calculated, from correspondent observations made either at Soobathoo or Kotgoor, the height of which places were very accurately ascertained, the former by three years barometric observations. The passes from West to East are as follow:

1. Shatool 15,555 feet, leading from Rol to Utharabees. This pass is reckoned worse than most of the others, not on account of its elevation, for it is inferior in altitude to many of the rest farther to the East, but from there being almost fourteen miles without even a single bush for fuel. It is open part of June, July, August, September, October, and sometimes November. The traders, even at the most favourable times, are cautious in crossing this pass. When the weather is threatening they generally halt in some cave, of which there are several

within three or four miles of the crest, and pass an uncomfortable night without fire; next day, should it be fair, they cross, but if there be any appearance of snow or a high wind they usually return. Frequent accidents occur here, but I never heard of so many people perishing at once, as near Boorendo Pass, probably from their being more circumspect; one man died in November, 1816, and I saw his skeleton about half a mile below the crest; two others were frozen to death in September, 1820. I saw the body of one, a month afterwards, not higher than 13,300 feet, but the corpse of the other has not yet been found. At this time two others escaped with great difficulty, having lost part of their toes; the steep part of this pass is about 2,200 feet of perpendicular height on each side, and there are a good many old snow beds of great depth. Shatool, although so difficult, has been crossed by more Europeans than any other pass, and Captain Hodgson, Surveyor General of India, has the credit of being the first European who visited it or any other pass to Koonawur.

2. Soondroo, from Tangno to Rasgramee. In June last I could not get a guide to accompany me to this pass for any sum of money: the people represented it as crossing two ranges, and said it was very seldom attempted, and was never open more than two months in the year; so it is probably little below 16,000 feet.

3. Yoosoo, 15,877 feet, leading from Jangleeg to Rasgramee. I had the greatest difficulty in prevailing upon any person to conduct me to it in June, and it is so bad that I wonder why it is

crossed at all; for the distance cannot be above seven or eight miles shorter than by Boorendo, and the road is infinitely worse. On the Southern face of the range, there are about seven miles without firewood, aad four miles South of Yoosoo, is Bundajan pass, 14,854 feet; after crossing this, the road descends for 1,200 feet at an angle of from thirty to thirty-four degrees, upon indissoluble snow, and thence the ascent to Yoosoo is 2,200 feet. This pass is crossed by very few people, and only during the two most favorable months. I cannot account for the extreme reluctance the guides shewed to visit Yoosoo and Soondro; it is, however, likely that some recent accident happened about this time of the year, although I could not discover the truth.

4. Boorendo, 15,171 feet, is the easiest pass in this quarter and most frequented; it leads from Jangleeg to Rasgramee, and is open seven or eight months. The space without firewood is not more than seven miles, and the upper limit of trees on the face, is only two miles from the crest. There have been many accidents here, and they are just as likely to occur as at Shatool, for, from the road being good, people cross this pass when they would not attempt the other: the guides point out a spot below the limit of forest, where upwards of twenty people, returning from Koonawur with salt, perished at once about six years since: they were overtaken by a fall of snow when on the other side, but they preferred trying the pass, to making a circuit of six or seven days journey; the wind got up, and they were so benumbed with cold by the time they reached the trees, that they were unable

to strike a light, and slept to wake no more. Another party of almost as many persons, were frozen to death nearer the pass in December, ten years ago. The roads leading to Boorendo are good on both sides, and during the rainy season almost all the snow dissolves.

5. Neebrung . .	16,035 feet	From Chooara to Sungla of Tookpa.
6. Goonas	16,026 „	
7. Ghoosool . .	15,851 „	

These three passes cross the top of the range within half mile of each other; they open on the abrupt side of the dell of the Pubur; and however strange it may seem from the small interval between them, yet it is a fact that they can only be travelled at different times. The road from Sungla, which is excellent and the acclivity gradual, is common to them all, until within half a mile of the crest of the ridge, whence the paths branch off; on the Pubur side the roads are excessively steep, and steps are cut in the snow; and they do not unite for two or three miles after leaving the crest.

The people, from long experience, know that Neebrung is always first open; it is crossed during June and part of July, after which it is rendered impassable by wide and deep clefts in the snow. Goonas is next practicable, and is passed in the latter end of July, August and September; when, in like manner, the snow-beds crack as at Neebrung, and the road goes by Ghoosool in October; after the end of which month, none of the above three passes are attempted by loaded people.

There are not more than seven or eight miles without trees, so these passes are not so dangerous

as Shatool; they are open sooner, and nothing but rents in the snow hinders them from being practicable at a later period.

8. The next in order is Roopeen, 15,480 feet, a very easy pass, and for seven or eight months a constant thoroughfare for people with merchandise, from Gurhwal and Doodroo Kooar to Sungla; the roads on both sides are excellent.

9. Nulgoon, 14,891 feet, is the lowest pass I have seen in the outer snowy range; it also leads from Sungla to Doodrookooar and is open for eight months: but as the road makes a circuit, it is seldom travelled unless in bad weather.

10. Barga
11. Lumbeea
12. Marja
13. Seenga

These four passes are contained in the space of little more than a mile; they lead from Sungla, Rakcham, and Chetkool, to Lewar of Gurhwal, and like Goonas, Neebrung and Ghoosool, are crossed in different months. Barga is reckoned lowest, so is probably little above 15,000 feet; it is chiefly travelled by the Sungla people, being on the direct road from that place.

The others are most likely between 16,000 and 17,000 feet, and are frequented by the inhabitants of Rakcham and Chetkool, who first attempt the nearest, and should it be impracticable from rents in the snow, they try the next, and so on, leaving Barga, which is easiest but farthest round, till the last. I wished to take a look at these passes, but could not do so without making a circuit of two or three days journey, which was unadvisable, as the periodical rains had commenced. Barga is open in

May, June, July, August, September, October, November, and sometimes part of December. The other three passes are seldom crossed, except in May, June, July, and the first half of August, on account of cracks and the snow sinking.

14. Kimleea is the straightest road from Chetkool to Lewar, and is rarely passable but during May, June, and part of July; afterwards the snow is treacherous, and many flocks of goats and sheep, together with the people who attended them, have sunk and perished. This pass is sometimes not travelled after the commencement of the rains, should they set in very heavy. I tried to reach it at the end of June, and got to the height of 15,500 feet, where I was overtaken by a severe shower of sleet; we sunk in the snow two or three feet constantly, the rocks were falling on every side, and the guides got greatly alarmed; so I thought it prudent to order a speedy retreat. The road, as far as I saw, was very bad, upon sharp-pointed rocks, most of which had descended from the peaks above, whichrose abruptly in the wildest forms. From my station the pass seemed about two miles distant, and 1,400 or 1,500 feet higher; so its altitude may be about 17,000 feet. Onwards, appeared an immense field of unfathomable snow, where scarcely a single rock projected its black head; the guides told me this snow-bed would bear a person's weight for the first half of July, early in the morning, before the sun had sufficient power to melt the upper surface, but after that it sunk at all times of the day.

15. Sugla, from Chetkool to Boorasoo of Gurh-

wal, is reckoned lower than Kimleea, and may perhaps be 16,000 feet. The road is said to be generally bad, and is travelled for six months.*

The last eight passes are crossed by loaded sheep and goats, but none of the first seven, although Boorendo and Shatool would certainly be passable by them at most times.

From the nearest village on one side of the range to that on the other, is from eighteen to twenty-four miles; and this distance is performed in three days by people with burdens, but unloaded persons accomplish it in two stages. I believe there is not one of the above passes, at which accidents have not occurred sometime or other; but they say nobody has been lost at either of the last six, for twenty years back, although many goats and sheep have perished, and some few

* There are three passes to the westward of Shatool, the Jalsoo, Khealig, and Soongree; but they cannot be considered in the Himalaya, being from 2,000 to 4,000 feet below the circle of congelation. From the above account of the Passes, it will be seen that Mr. Fraser's saying there is no Ghat for the conveyance of merchandise through the Himalaya, between Rampoor and Budreenath, is erroneous. The whole of these fifteen passes are almost as good as the Rampoor road, and many of them considerably better. Most of the passes to the eastward are said to be better than those I have mentioned: some of them are,

Shear garh, a difficult pass.
Boorasoo to Chungsa, much snow, and rather difficult.
Jannubee to Chubrung, high but very easy.
Kedarnath, said to be very difficult.
Doomnees, from Budreenath to Chubrung; the pass is high, there is much snow, but the road is good, and is travelled by loaded cattle.
Birjee Pass.
Neetee.
Dharma.
Jooar.

These last four passes are travelled by cattle.

persons have been deprived of their toes by the frost.

The passes leading from Koonawur to Chinese Tartary on the eastward, are six in number, all of which are practicable for loaded sheep.

1. Chungsakhago, from Chetkool to Neilung, on the Jankee or Jannubee branch of the Ganges, a lofty pass, probably not under 18,000 feet. There are five or six stages, without a village, and the road is good, the ascent gentle and not rocky; but there is a full march-and-a-half almost quite plain, laying through snow, upon elevated table land, which makes it dangerous. In the latter end of June, not even a present of fifty rupees, which I offered, was sufficient to induce any body to shew me the way, although they said they would accompany me after the end of the rains: they likewise mentioned that my servants could never travel in their present dress, but must be clad in sheep-skin from head to foot, and wear boots and gloves. Neilung lies between Busehur, Gurhwal, and Chinese Tartary, in a small district named Chungsa, comprehending a few villages, inhabited by Tartars;* it contains lead and copper mines,

* Mr. Fraser has the following information—"Chounsa is described as being a month's journey from Dhuralee, at twelve coss per day; from Chounsa it is stated to be a month's journey to Chaprung, 10 stages being along the Jannevie, and one day's journey through snow, and from Chaprung to Gara, is likewise a month's journey. The city of Tooling is passed through midway between the two last places, and the Sutluj in that country is called Lang-gin-Thang."

These distances are uncommonly erroneous, and I have seen so many people who have travelled the route that I cannot be misinformed.

Chounsa, on the bank of the Jhannevie, is evidently Chungsa on the Junnubee branch of the Ganges; its distance from Dhuralee is only five

and is tributary to each of the above three states; there is no cash paid, but only some copper, lead, and blankets: fifteen or twenty years ago the tribute was withheld from Busehur, for which reason Runjeet, brother to the present Wuzeer Teekumdas, plundered it, but on his return he lost most of his booty, for eighteen of his people were frozen to death in crossing the high pass, and the rest threw away almost all they carried; since the above accident, the tribute has been sent round by Bekhur, and few people have attempted the pass. Before this time it used to be crossed in May, June, and October, but never during the rainy season, for fear of a fall of snow.

2. Koono Pass, from Koono to Tango.

3. Teedoong, from Charung to Tango.

These two roads are each about five days journey, without an intermediate village, and like Chungsakhago, cross a high flat piece of ground; but by being farther removed from the outer Himalaya,

stages. From Chungsa to Chubrung the road leads along the river no more than three days, and the whole distance is five or six days' journey at the utmost; the pass is high, but not difficult, and there is little snow. Thooling, rendered famous by the Temple of Mahamonee, which is resorted to by all the Lamas of Koonawur, is commonly called half a stage, or five miles N. E. of Chubrung. Seventy or eighty Koonawurees accompanied the Wuzeer Teekumdas from Busehur to Chubrung, and thence to Budreenath, and I examined a number of them, most of whom had visited Thooling, and their accounts agreed minutely. From Thooling to Gara, or Garoo, is generally performed in four days, but the stages are long. My informants call the Sutluj, Lang-zhing-Khampa.

Mr. Fraser is correct in thinking Numroo on the two routes for Leh, and Shealkhur to Garoo, to be the same place; and it may appear strange to persons unacquainted with the country, that this very place occurs on the road from Garoo to Chubrung; but whoever has seen the mountain regions, will not be surprised at it, for a circuit of fifteen or twenty miles, to avoid an impassable obstacle, is very common in the Himalaya.

there is much less snow. Judging from the nature of the country thereabouts, I should think these passes 18,000 feet at least: the road from Koono is longest, and it is open four or five months; the other, which is shorter, leads up the bed of the Teedong, but it is confined by such rugged cliffs, as scarcely to be practicable until the river is frozen hard enough to bear the weight of loaded sheep.

4. Keoobrung, from Nisung to Bekhur, five stages without a village. The road leads up the Taglakhar river for $3\frac{1}{2}$ days, and is often difficult: the first ascent met with is Rothingee, 14,638 feet; the path then descends to the stream, the declivity of which is so rapid, that at the end of the third stage, the halting-place on its bank is 14,700 feet; Keoobrung Pass, 18,313 feet, next occurs, whence the road descends for 4,400 feet of perpendicular height. Another ascent of 1,900 feet to Hookeo Pass succeeds, whence is a gently undulating plain, covered with prickly bushes, and studded with ammonites for several miles, at an elevation of from 16,000 to 16,600 feet, and then there is a descent to Bekhur.

This route is frequented in June, July, August, and September; and notwithstanding the extraordinary altitude of Keoobrung, I found no snow on the way in July. The distance without firewood, from one side of the range to the other, scarcely exceeds four miles.

5. Gangtung, from Dabling to Bekhur. This, properly speaking, is not a distinct road, as it joins the other nineteen miles from Dabling, and then

ascends Keoobrung and Hookeo as before. The path leads up the bed of a stream to the Pass, which is 18,295 feet, where there are deep beds of old snow; the space without fuel is about eight miles, consequently this road is not so much travelled as the other. So mild is the climate of this country in summer, that although I crossed both Keoobrung and Gangtung in July, during a shower of snow, the temperature of the air was not below 33°, and the only thing that alarmed the guides was, their losing the way in a dense cloud. I had fortunately taken the bearing of a pile of stones at the Pass a short time before, so I steered directly for it by the pocket compass, without seeing the mark of a foot-path for a long distance. When we were involved in the cloud, a continued noise, more resembling the howls of wild beasts than any other sound, was kept up to apprise the people in the rear, of the direction.

The lower passes through the outer Himalaya would never have been attempted by loaded persons in such weather as I crossed Gangtung, for it snowed and sleeted the whole day.

6. From Numgea to Shipke there are two roads: 1st. Peeming, the height of which is only 13,661 feet. Part of this path is very rugged in clearing the deep-worn glen of the Oopsung rivulet, where the rocks are jumbled together in a frightful manner. This way is seldom travelled by beasts of burden; and the other Pass, Kongma, is the usual route. It is 16,007 feet above the level of the sea; and the road is good, but very steep and tiresome. The distance is ten miles and a quarter, and

is generally accomplished in part of two days; its altitude above the town of Shipke is 5,400 feet, and it is 6,800 feet higher than Numgea. I travelled this space within seven hours from the Shipke side; and there was not the least snow near the road, which is open six or seven months at least.

There are four passes leading to Speetee:

1. From Pundrabees.
2. Taree from Wangpo. } open five months.
3. From Leepe, not ascertained.
4. Manerung from Soongnum, open three-and-a-half or four months.

The first two are probably little under 17,000 feet; the third I should reckon 18,000; and the fourth, which is the only one I measured, is 18,612 feet. The first three roads are four stages without a village; and the Taree Pass, by which route loaded horses and mules travel, is the best now in use, when the snow is not rent. The one from Leepe is reckoned better; it is said to be lofty, but there are no rugged places, and it used to be crossed by yaks. I only saw two people who had gone this way; for when the inhabitants of Busehur and Speetee were at war, on account of its easy access, the villages nearest it on each side were plundered, and the flocks carried off so constantly, that they were deserted for many years; and on the conclusion of peace, it was agreed by both parties that no person in future should travel by this road; so there has been no communication by it for almost fifty years.

From Pundrabees the paths are indifferent, but they are passable by sheep and goats.

Manerung is very difficult* and rocky in many parts; it leads up the Darboong for seventeen miles, and the ascent from the Soongnum side is two miles, often upon slippery snow beds, and very fatiguing; the angle of the slope is generally 30°, and when I crossed it in August, there was only about a foot of new snow, that had fallen a few days before, but the old snow beds on each side were thicker and greater than I ever saw at any other place. The distance without firewood at this pass is eight miles and a half.

There is another road, travelled during the winter months, which leads from Shealkhur to Speetee, along the bank of the river.

Besides the above, there are several lofty spurs dividing one portion of Koonawur from another; such as Hungrung 14,827, Roonung 14,503 feet, and many of 12,000 and 13,000 feet. Hungrung is crossed by unloaded people in the cold season with some danger, by reason of the snow, and accidents are not uncommon. In January, 1820, one man perished, and another, whom I saw, lost all his toes in February 1816, from remaining a night among the snow. The only other pass that deserves to be mentioned is Charung, which I crossed in the beginning of July; it leads behind the huge Ruldung peaks, over the range that divides the Teedoong from the Buspa. Its altitude

* Notwithstanding the difficulty of this pass, the sheep I had for the conveyance of grain, to my astonishment reached the encamping ground the day I crossed, at the same time I did; but only a few people arrived that night. Some came up next day, and many of them were unable to cross the pass from severe head-aches, and I did not see them till after my return from Speetee.

is 17,348 feet, and the ascent for nearly three-quarters of a mile is worse than any I ever saw; the angle is 37°, upon gravel, snow, and loose stones, giving way and tumbling down every instant. This pass is open for three months, and would be travelled longer, were it not for the immeasurable snow beds on the northern face, which often conceal deep lakes; and as they are within the influence of the periodical rains, soon after their commencement they crack and sink. The roads to the most frequented passes generally lead along the easy side of the dell; the other face is dangerous after 12 or 1 o'clock, and the people are well aware of this circumstance; there the snow is for the most part perpetual for 1,000 or 2,000 feet, the cliffs being too abrupt for it to find a good resting place, and after a certain quantity has collected, it cracks, falls outwards, and descends to the bottom, bringing down an incredible deal of rock and rubbish; consequently, at the foot of this face of the valley it accumulates, and from its quantity becomes indestructible. These snowbeds are sometimes found at 10,000 or 11,000 feet, and over streams they are often hundreds of feet in thickness, the upper surface being so loaded with fragments of rock, that the snow is not perceived unless by looking under the arch that gives passage to the river. Soon after the beginning of the rains, the precipitous side of the glen presents banks of snow eighty or a hundred feet thick, where it has cracked; and in this way some of the steep passes through the outer range become impracticable.

When I crossed Manerung in August, I could

not get all my people to move till past nine, notwithstanding what the guides said about the danger of delay. We were on the rugged slope of the dell for more than two hours after noon, and there was a continued rattling of rocks almost the whole time; immense avalanches of snow descended, carrying with them many large stones and thousands of splinters, and some of my followers had very narrow escapes: twice I saw a considerable piece of rock pass with extreme velocity between two of them, not more than four feet asunder. It is the melting of the snow from the sun's rays that chiefly causes these avalanches, and during a shower of rain the descent of the stones is just as frequent as I witnessed near Kimleea, where many fragments of great bulk, dislodged from above, tore up the path at no great distance from us. Large portions of rock fall yearly, and their effects are truly dreadful: they commit the most horrid devastation, and even stop the channels of the largest rivers for weeks. An instance of this kind is still remembered by some of the inhabitants of Belaspoor. About fifty-five years since, forty or fifty miles above this town, an immense mountain gave way, filled the bed of the Sutluj, and arrested the passage of the stream for above six weeks; during this time the inhabitants were anxiously looking out for the bursting of the embankment; when it did give way, the rush of such an overwhelming body of water may be more easily conceived than described. People were stationed on the heights all along, from the place where the stream was stopped as far as Belaspoor, and they gave notice of the approach

of the flood by firing matchlocks. The news arrived in time to save the inhabitants, but the whole of the town was swept away. Many people are destroyed by avalanches every year; only in February last no less than eight were buried under one: this took place near the fort of Hutoo, at a part comparatively safe to many I have seen in Koonawur.

The cold likewise causes the stones to be precipitated from above: at night, when I have been encamped at Shatool and Boorendo, where the thermometer was many degrees below the freezing point, I have been kept awake for hours by the continued falling of rocks, no doubt split in pieces by the frost.

The craggy side of the glen is full of danger in every shape: you have now and then to cut steps with a hatchet in the snow beds, which are inclined at such an angle that a single slip would be destruction. I have often hesitated at such places, and many of my people preferred going round half a mile to avoid them; it was not so with the guides, who never stopped a moment, and they were so expert at cutting the steps, that although I followed them close, they had frequently finished their work, and were at the other side of the ravine, before I got half way. Those people, trusting to their activity, persisted in making the steps at such an inconvenient distance from each other, that it was necessary to strain every muscle to reach them. It is here, also, that the road now and then skirts the icy margin of a deep blue lake, where it requires great labour and time to make any kind of a path,

which at best is very unsafe, from the declivity and slipperiness. The guides, if possible, always avoid the lakes, by a long circuit, or by scrambling over the sharpest pointed rocks.

DIFFICULTY OF BREATHING.

On lofty mountains a depression of spirits and bodily debility, accompanied by severe head-aches, fullness in the head, oppression at the breast, and difficulty of respiration, with now and then pains in the ears, affect every body in a greater or less degree; this arises from the rarefaction of the atmosphere, of which I have had numerous proofs, for I have visited thirty-seven places at different times, between 14,000 and 19,400 feet, and thirteen of my camps were upwards of 15,000 feet: it is worthy of remark, that the Koonawurees and Tartars estimate the altitudes of the passes, by the difficulty of breathing they experience in ascending them. Those who cross the outer chain, attribute these symptoms to the noxious qualities of a poisonous plant; but the best informed, who are in the habit of traversing heights where there is no vegetation, know well that they are produced by the height alone.

It may, however, be noticed, that the difficulty of respiration does not affect every body equally, nor the same person at all times; and it probably depends in a great measure upon the state of his health, for when I have been the least unwell, I used to be troubled with head-aches at 13,000 feet, whilst I have experienced nothing of the kind at 16,000 feet. At Boorendo, 15,000 feet, I had a

severe cold, and I felt a sense of suffocation, while at rest, worse than I ever experienced at 19,000 when in motion.

Exertion of any kind, especially ascending hills, increases these symptoms, and at from 17,000 to 19,000 feet, head aches are almost constant, and a person can scarcely take half a dozen of steps without a rest.

When encamped above 16,000 feet, the difficulty of breathing was really distressing, and I have often thought myself on the point of being suffocated for hours together.

Few people who have not travelled over the same ground, can form an accurate idea of the length of time required to perform a journey of twelve or fourteen miles on elevated land. I have walked thirty-four miles in a country that would be reckoned mountainous, by most persons who have not seen the more rugged parts of Koonawur, with far greater ease to myself, and in less time, than a march of twelve miles has occupied me in higher places; an ascent of 5,000 or 6,000 feet of perpendicular height, is not uncommon in a stage, and after the elevation exceeds 14,000 feet, every mile, even where the road is good, requires at least twice as much time as the same space at an altitude of 7,000 or 8,000 feet. The depression of spirits and bodily debility experienced on lofty mountains, affects every body in greater or less degree, and a friend of mine was more exhausted at an ascent and descent of 5,000 feet, upon elevated land, where the distance did not exceed nine miles, than in walking from Nahun to Soobathoo, forty-five

measured miles: he performed this journey in sixteen hours, including halts; yet two of the ascents on this road are 2,600 and 2,200, and several of the others 1,000 feet of perpendicular height, and the descents are in the same proportion.

SHUGHARS.

At all the elevated passes there are a number of square piles of stones, called Shughar, upon which passengers usually place a piece of quartz, or attach rags to poles, which are fixed in the middle; there are also several shughars on the neighbouring heights, sacred to the deotas, or spirits of the mountains, who are supposed to inhabit the loftiest and most inaccessible points, especially where there is much snow. The shughars at the passes are erected by travellers, but those on the higher peaks are commonly made at the expense of some wealthy pilgrim not much accustomed to the mountains, who has succeeded in crossing a pass, which is reckoned an arduous undertaking by an inhabitant of the plains.

When my brother and I stopped at Boorendo, in October, 1818, the guides requested us to give them some money for the construction of two shughars, to propitiate the genii of the place, otherwise we should undoubtedly perish from cold, since it was a thing unheard of to halt at such a height. We might, perhaps, have indulged them, had we not thought we should have had many demands of the same kind. We likewise wished to shew them the possibility of remaining a night at the pass without

paying attention to their idle superstitions; they, however, contrived to inspire our followers with such terror, that even our Mahommedan servants built two shughars, and adorned them with pieces of cloth. At some of the passes, where the ground was entirely concealed by snow of a great depth, we were surprised to find it completely covered with a kind of gnat, resembling a musquitoe; they were in a state of torpidity, and at first we thought them dead, but breathing upon them caused them to jump about, and the sunshine revived them.

SEASONS AND CLIMATE.

The climate of Koonawur is as varied as the face of the country, and a person may experience every change, from the heat of the torrid zone almost to the frozen temperature of a Lapland winter; I had once a transition from 33° to 109° of Fahrenheit, in a distance of thirteen or fourteen miles, and this occurred nearly at the same times of the day at both places; had it been from sunrise at the highest, till 1 or 2 P.M. at the lowest station, the difference would have been 10° or 15° more.

The growth of plants depends upon situation and the summer temperature, and not the absolute altitude of the place; thus, near the outer Himalaya, which is partly under the influence of the periodical rains, at villages only 8000 feet above the level of the sea, which are considerably removed from the bed of a large river, there is only one harvest; but, in the interior, there are two crops upon the same ground, even at 10,000 feet, if the spot be in a valley surrounded by mountains that do not conceal

the sun too long. In the former places the temperature is much more uniform than at the latter, where the summer is sultry, and the winter extremely cold. From 8000 to 10,000 feet, in favourable situations, such as Murung, Soongnum, Chango, and Leeo, the temperature of July and August is from 68° to 72°, and the October temperature is about 50°; at 12,000 feet, the summer temperature, from a few observations, appears to be from 59° to 64°, and in October, it is 3° or 4° below 40°; but at this time the thermometer, at sunrise, is from 20° to 28°.

Generally speaking, the spring months are March, April, and May, in which there is a good deal of rain, but, at 12,000 and 13,000 feet, there can be scarcely said to be any spring, as the grains are seldom sown till the end of April; they, however, sprout up with astonishing rapidity, and are even cut in August; but there is no time for a second crop at these elevations, as the frost is severe in the beginning of October. June, July, and part of August, form the summer; and the latter end of August, September, and October, are the autumn months, according to the height. Snow always falls in November, if not sooner; it commonly lies till April, and sometimes even longer. In the interior, at 9000 and 10,000 feet, snow is scarcely ever above a foot in depth, and at 12,000, it is very rarely two feet, although, nearer the outer range, four or five feet are usual at heights of 7000 or 8000 feet. In these last places, there is rain in July, August, and September, but it is not near so heavy as in the lower hills. When Hindoostan is deluged

for three months, the upper parts of Koonawur are refreshed by partial light showers; and, with the exception of the valley of the Buspa, the periodical rains do not extend farther to the eastward than long. 77°. In these months, the few clouds that pass over the Himalaya are attracted by the lofty mountains, and form a pretty regular belt at 16,000 and 18,000 feet, above which the chain of snowy summits protrudes its sharp points.

In summer, from the reverberation of the solar rays, the heat in the bed of the Sutluj, and other large streams, is oppressive, and quite sufficient to bring to maturity grapes of a delicious flavour, of which raisins, and two kinds of spirituous liquor are made;* in July and August, even at the highest places, the sun's force is powerful; at 16,000 and 18,000 feet we always found an umbrella necessary, and at Neebrung Pass the thermometer, lying on the ground for a few minutes, rose to 105° in the sun, although the temperature of the wind at the same time was only 33°.

The winter is often rigorous, and in some parts there is scarcely any moving out of the villages from the quantity of snow.

The winds blow with the greatest violence in October and later in the year: their direction is, of course, influenced by the valleys; but, on peaks upwards of 20,000 feet, off which I have seen the snow drifted in showers for days together, and at heights of 16,000 feet, the winds were always from the W. or S. W. They are so prevalent from these quarters, that, on the way to the high passes, the

* One resembles whiskey, and the other is not unlike raisin wine.

enclosures for the cattle, which occur at each stage, and are erected of loose stones, have always the western side highest: at this season the wind is perfectly devoid of moisture, and its extreme aridity is such, that it parches up every thing exposed to it, and the boards of our books were more bent than I ever remember seeing them during the hottest weather in the plains of India. The winds are generally at their highest between two and three P. M., and so great is the fury, that a person on an exposed place can keep his footing only with the utmost difficulty, even when the thermometer was 4° above freezing point. So rapidly was the heat withdrawn, that standing five or ten minutes in the draft, I have had my hands so benumbed with cold, that I could not use them for a couple of hours afterwards. The inhabitants know this well, and when we crossed passes of 14,000 and 15,000 feet in the end of October, the guides were always eager that we should start at sunrise, or soon after, although the temperature was below freezing, on purpose that we might reach the highest places before the wind had attained its utmost force.

AGRICULTURE.

The spaces of arable land are few, and the cultivation is commonly in narrow strips along the brows of the mountains. The crops for the most part are poor, and a great want of grain pervades the whole country: in times of scarcity, horse chesnuts, after being steeped in water for two or three days to take away their bitterness, are dried and ground into

flour, and apricots and walnuts also form part of the food of the people.

Where there are two crops, the standard grains are barley, phapur (Fagopyrum esculentum), and ogul (Fagopyrum emarginatum); barley is sown in March and April, and cut in July, after which the ground is prepared for the ogul and phapur, which are reaped in October. At the places where there is only one harvest, the crops are ooa (Hordeum cœleste), wheat, phapur and barley; they are sown in April, and cut in August and September. Wheat and ooa are not productive in low situations; at 10,000 and 12,000 feet they thrive best. The ooa, which is mentioned by Dr. Wallich in the Flora Indica, is the most hardy grain, and I have seen both it and phapur at 13,600 feet.

The limit of culture of the South-western face of the Himalaya is scarcely 10,000 feet, and it is somewhat odd that both it and vegetation get higher as you advance into the interior of this extraordinary country; on the North-eastern slope of the outer snowy range, to the westward of long. 78°, the highest cultivation is 10,500; in the valley of the Buspa, it is 11,400; and in Hungrung, the extreme elevation of grain is 13,000 feet, which I believe is the highest spot where it ripens in this quarter. The fields I saw at 13,600 feet were very poor, and the people said they would never be properly ripe, although in Chinese Tartary grain comes to maturity in the vicinity of Koongloong, which must be almost 16,000 feet above the level of the sea, and within the circle of congelation.

The other grains are bathoo (Amaranthus Anardhana), cheena (Panicum miliaceum), koda (Paspalum scrobiculatum).

There is a little rice at one village only.*

I have seen wheat flour so cheap as sixty pounds per rupee, but the average price in Koonawur is from thirty to forty, and in October and November it is scarcely to be procured for any money.

There are gardens belonging to most of the villages; they are neatly arranged, watered by copious streams, and fenced with hedges, or where there are no bushes, they are enclosed by stone dykes.

The kitchen vegetables are peas, beans, greens, and turnips, all of them well tasted; the peas and beans do not thrive below 8000 feet, and the turnips, which are the largest and finest I ever saw in India, are in the highest perfection at 10,000 or 11,000 feet.

The people have begun to cultivate the potatoe, which is very productive, but not near so common as it ought to be, considering that my brother Patrick, at different times, distributed more than 2,000 lbs. weight of this valuable vegetable, to be planted throughout Busehur.

* The greatest height at which rice that requires water has been observed, is 6,600 feet. There are other kinds, which are not watered, that grow at 8000 and 9000 feet; but what is produced in Kashmer, which forms the chief subsistence of the inhabitants, requires the fields to be laid under water, as in Bengal; whence we may infer the extreme altitude of that far-famed valley to be 6000 feet. This height also accords with the declivity of the Jhelum, which may be taken at forty feet per mile, since the country through which flows, as far as my enquiries extend, is said to be similar to the lower course of the Sutluj, the fall of which is forty feet. If the plains of the Punjab be reckoned 1,300 feet above the sea, which is probably not far from the truth, the fall of the Jhelum, at forty feet per mile, will give about 5,900 feet for the elevation of the capital of Kashmer.

The variety of situation makes a much greater difference in accelerating or retarding the crops, than the elevation. There is a remarkable instance of this, in comparing Numgea, Shipke, and Nako together; the first place is only 9,300 feet above the sea, but it is environed by such lofty mountains, that on the longest day there is scarcely nine hours of sunshine. In the beginning of August the crops there were perfectly green, whilst those at Shipke, 1,400 feet higher, were all yellow, and some of the grains even cut. Near Nako, where the culture extends at least to 12,700 feet, the crops on the very same day had begun to turn, and were in a far greater degree of forwardness than those at Numgea. The grain is generally trodden out by bullocks or yaks, in large circular enclosures paved with slates, the walls are one-and-a-half or two feet high, and in the centre is a post to which the cattle are tied in a line forming a radius, and made to revolve; they are muzzled, and I have seen twenty or thirty employed at once.

The grain is either measured or weighed. The measures differ much in different places, but the weights are pretty uniform; the kind used in Koonawur is called Pore, and is upon the plan of the steelyard, the weight being moved nearer to or farther from the point of suspension. There is another kind of balance named Tool, upon the same principle, with this difference, that the weight is formed in the lever by a knob of iron, and the fulcrum, which is a piece of string, is shifted according to the gravity of the thing weighed. The smallest weight is three-quarters of a rupee, and it

is used for butter, opium, and tobacco; and, from the inequality of the arms, is often inexact. The largest is much more accurate; and I have tried several, and found them vary no more than from 155 to 160 Sonat Rupees. The grain is kept in chests, and ground when required, most usually in water-mills, like the one described by Major-General Hardwicke, in the Asiatic Researches. A water-mill is situated on the bank of the nearest stream, and often belongs to several villages.

TREES AND PLANTS.

The forest trees are never planted, and the most common are birches, oaks, and pines. The pines are of six kinds, the native names of which are,

Raee or Ryung.

Kyl or Leem.

Neoza or Ree.

Keeloo or Kelmung. } Upper limit above 12,000
Khutrow. } feet.

Cheel or Cheer; this last, which is so plentiful on the lower hills, is seldom found in Koonawur; its upper limit is 6,000 feet, and the country is too elevated for it.

The oaks are of three species, the leaves of all being lance-shaped, more or less serrated, and some exactly like holly. They are,

1. Mouroo. } The two first grow to 12,800 feet.
2. Khursoo. }
3. Ban. Disappears at 8,000.

Some of the other trees are rhododendron; maple, plane, ash, hazel, horse-chesnut, rose, mountain-ash, and juniper.

The rhododendron seems to be of three sorts; one flourishes at from 6,000 to 10,000 feet, and has a large red flower; another kind is found at 11,000 or 12,000 feet, and the blossom is very beautiful, being of a delicate pink colour, with a fragrant smell; the third species is common from 12,000 to 14,000 feet, and is a small bush, and the leaves when rubbed between the hands, emit a highly aromatic odour.

The juniper appears to be three sorts. One called Pama is an immense creeper; another Shoor or Shookpa, is a tree of fifteen or twenty feet, on which are a few small cones; and the third is a bush named Bettir.

The most valuable timber by far is the Keloo, which grows to twenty or thirty feet in circumference, and I measured two trees of thirty-three and thirty-four feet; I have seen them 150 feet high, and they may be 200. It is astonishing what a quantity of this fine wood is wasted, even where it is scarce, for the saw is unknown; and to get a plank of any size, they split a tree into several thick pieces with wedges, and then fashion it with an adze, thus losing the greater part of it. The keloo seems to be either the Cedar of Lebanon, or something very like it. It is almost indestructible, and is therefore used for beams of houses, temples, and especially granaries, as no insect touches it.

An oil is made from the keloo, which when rubbed on any other kind of timber, is a great preservative against vermin. This wood has an agreeable smell, and would be invaluable in the plains of

India; as it resists the attack of the destructive white ant.

A few of the plants are rhubarb, honeysuckle, and a great variety of ferns. There are cowslips, pinks, and thousands of other flowers, of which thyme is so plentiful, that you often meet with large beds in full bloom, which perfume the air. Wild leeks are common, and I have found them above 15,000 feet, in the greatest perfection. Zera or cummin is abundant in the woods, and it forms one of the exports to the plains.

WILD FRUITS.

Some of the wild fruits are black and red currants, gooseberries, barberries, juniper, cherries, raspberries, strawberries, neoza, pears, byr, and kuronda.

The black currants are best on the northern slope of the mountains, at 10,000 or 11,000 feet; they are large and very fine, but the red kind is insipid and sweetish.

Gooseberries have not been seen below 10,000 feet. They are small, of the red sort, and extremely acid, but are well adapted for preserves. The people do not eat the fruit, but use the bushes in constructing hedges round their gardens.

The barberries are of several sorts, all highly flavoured. The only juniper that is eatable is the creeping species, the rest being very bitter.

The cherries are very small, more than two-thirds of them being occupied by the stone, but they make excellent cherry brandy.

The pears are indifferent, and some of the rasp-

berries and strawberries, of which there are three or four kinds, have a fine flavour.

The raee pine, producing the edible nut, flourishes from 6,000 to 11,000 feet; the leaves resemble those of the common fir, and the tree does not often grow straight, but the branches shoot out from the bottom. It contains a great quantity of turpentine, and the rainy season is probably injurious to it, for it is not found naturally to the westward of long. 78°, where the rains end. It has been planted about Rampoor and Sooran, but it has never borne any fruit.

It grows wild in vast forests, and the cone is large like an artichoke, and is the same as that mentioned by Mr. Elphinstone, under the name of Jelgoozeh. The people collect a good many of the cones, and the seed is taken out by placing them on the fire, which causes them to split; in size, shape, and taste they are very similar to the pistachio nut; in Koonawur they sell at thirty or thirty-six lb. per rupee, but very few of them find their way to the plains, where they are much liked; the only ones I ever saw there, came from Peshawur, and at Mooradabad they sold at a rupee per pound.

GARDEN FRUITS.

The garden fruits are grapes, apricots, apples, peaches, and walnuts.

The vineyards are commonly on the bank of a stream at some distance from the villages; they frequently extend for half a mile, and are in form of arbours with latticed roofs, supported on posts

six or seven feet high, the vines are carefully made to creep along the top, and the bunches of grapes hang down inside.

When covered with verdure, these bowers are impervious to the sunbeams, and afford a grateful retreat to the traveller, but he must not attempt to enter one by himself, otherwise he will certainly be torn in pieces by the dogs that guard it.

There are eighteen kinds of vine cultivated in Koonawur, each having a distinct name, taken from the size, colour, shape, or taste. Some of them are of a luscious flavour, and when ripe, the people invariably come to meet the passing stranger with large bunches of them.

They are in great abundance, and sell at 60 or 70 lb. per rupee, and some of the sorts, when not sufficiently supplied with water, degenerate into the small kind without stones, called currant, which is generally, but erroneously, supposed to grow upon bushes; these last are very scarce, and not easy to be produced at any price.

The grapes flourish at various elevations, and it depends upon the summer temperature and situation more than altitude: they thrive well at Soongnum 9,500 feet above the level of the sea, where the mean annual temperature is about 48°, although in July and August the mean heat of the thermometer is 70°, but they seldom come to maturity at 6,000 feet, if the place be much above the bed of a large stream.

Part of the grapes are dried in the sun on the tops of the houses, and the price of raisins is from

thirty to forty pound per rupee, and part is made into liquor.

The apricots are planted in avenues, or around the villages. They are of two kinds, one of a yellow colour, named Chool; the kernel is very bitter, and from it is made a fine oil, which smells like bitter almonds, and burns with a clear flame; the other, called Boorzha, is much the best, the colour is rosy, and the kernel, which is eaten, tastes like an almond; the finest I ever saw were at Soongnum, and there were only two or three trees of them: the seed originally came from Cabul or its neighbourhood, and, when dried, they are exactly the same as those brought from the westward, under the name of Khoobanee.

The apricots are dried in the sun, and in this state are somewhat similar to prunes, but not so good; this fruit thrives at different heights, from the bed of the Sutluj almost to 11,000 feet.

The apples are nearly as large as those that come from Peshawur, but their flavour is far superior: the best are at Soongnum, Kanum, Lubrung, and Leedung.

The peaches are inferior, and walnuts ripen but in few places.

The people set but little value on their fruit, and often have I been pleased to see them with their honest faces bring loads of grapes and feast all my followers; or when we passed through an avenue of apricots, five or six of them generally mounted the trees, and shook them so as to shower down the fruit in the greatest abundance.

The apricots ripen in July, but the grapes and

apples are not ready until the latter end of August, even in the most favourable spots, and the time in which they are in the best perfection, is September.

ANIMALS.

The domestic animals are horses, cows, sheep, goats, asses, mules, hogs, dogs, and cats. In the higher parts cows are rare, and their place is supplied by the Yak of Tartary, described by Captain Turner; the male is called Yak, Yag, or Yakh, and the female Breemo; the produce between them and the cow is common, the male being named Zo or Zofo, and the female Zomo. The Yaks are strong and hardy, and like cold places: they are mostly used in the plough, but are also employed in carrying burdens. They are often extremely vicious, and I have more than once seen one put to flight all the inhabitants of a village, who were obliged to take refuge on the tops of the houses. The cross breed is much more docile.

The fleece of the sheep is fine, and makes comfortable blankets, and that of the goats, especially in Hungrung, approaches towards the shawl-wool, but there is scarcely any of it.

The dogs are of a large ferocious breed, resembling wild beasts in their nature; they are covered with black wool, and are very adverse to strangers, whom they often bite and tear in a most shocking manner; they are generally chained during the day, otherwise it would be dangerous to approach a village. The fleece, especially of the young ones, is almost equal to shawl-wool.

Black bears are numerous, and they commit such ravages amongst the fruit, that during the grape season two or three people from each village, together with their dogs, keep up an incessant howling and barking the whole night to drive them off: they likewise attack the crops, and dig for the honey of the field bee, but rarely touch a person unless when wounded.

There are some white bears that stay near the snow; they have no resemblance to the Lapland breed, and are like the others in all but colour; they are uncommon, and I never saw more than two.

The other wild beasts are a kind of panther, or tiger cat, that carries off sheep and goats. Hogs, hares, and deer of many sorts are plentiful; they are eaten by the natives, and the horns of the latter are nailed in pairs on the outside of the temples; there is one species, called Sar, that seems to be the wild goat; it is only found amongst craggy cliffs and inaccessible places.

There are animals about the size of a dog, named Chungkoo and Mangsa; the former are white, and the latter red. They go in packs, hunt deer and chase flocks, but I could get no account of what species they belong to. House rats and mice are scarce; but there is a kind of large rat without a tail, found in innumerable quantities, at 12,000 and 13,000 feet, where they cut up the turf into thousands of furrows.

The common and musk deer are either run down by dogs, or shot with matchlocks; and the people are very fond of this sport.

BIRDS.

The birds are, pheasants of many varieties, of the most gaudy plumage, which live in large flocks near the snow; hawks, the Baz (female), and Joorra (male), both highly prized by the wealthy natives of the plains;* there the former sells at eighty or ninety, and the latter at fifty or sixty rupees each; they are caught in springes or nets: eagles, crows, kites, pigeons and Chukors are in plenty, and in the arid places, the two last birds go in flocks of fifty and a hundred.

The most beautiful bird I have seen in the hills, is named Peeara, and is found at the upper limit of the forest. It is scarce, and on account of the great diversity of its colours, the natives call it the king of the birds; it seems to be a species of pheasant, and its flesh is a great delicacy.

REPTILES, INSECTS, ETC.

The most common of these are snakes†, lizards, frogs, spiders, fleas, moths, butterflies, caterpillars, grasshoppers, flies, and bees.

Fish are not abundant, and I have only seen one kind, with small shining scales, which resembles the trout. The natives rear bees, which are lodged in apertures of the walls of houses. In the lower hills, where flowers are plentiful throughout the year, the honey is collected in spring and autumn; but, in

* These birds are very expensive to keep; each requires an attendant, besides a Shikaree, or sportsman, to kill its food.

† I have seen several snakes in Koonawur; the natives do not kill them, and they say they are not venomous, but I saw two very like the Cobra de Capello.

the higher places, only in autumn: the latter season produces the finest quality, which is very white and pure, but, before it reaches the plains, it is always adulterated with coarse sugar. The honey is procured without killing the bees, by smoking them out with burnt straw; only half of it is taken away, so the bees return. The people scarcely know the use of wax; most of it is thrown away, but a small quantity goes to Rampoor, where it is purchased by merchants from the plains.

INHABITANTS.

The inhabitants are generally of a dark complexion, but good looking, and some of them have ruddy faces; they are well made and muscular, and their stature is from five feet five inches, to five feet nine inches; they are frank, active, generous, hospitable, and highly honourable in their dealings. Thieves and robbers are unknown, and a person's word may be implicitly relied upon, in any thing regarding money matters. They have not the least distrust or suspicion, and I had two remarkable instances of this kind, which is so very opposite to the character of the natives of lower India.

I reached the village of Koono without a single farthing, not even to pay the guides, owing to the money I expected having been sent up to the valley of the Sutluj. An inhabitant of Thungee whom I had only seen once, when he heard of this, advanced me twelve rupees, which he said I might repay when he visited Rampoor in November. I had an opportunity of rewarding this person, for I received a supply of cash next day.

I was exactly in the same predicament when I left Soongnum for Manes; and Putee Ram, the intelligent Koonawuree, mentioned by Mr. Fraser, who is better known by Lahoureepung, the name of his house, gave me ten rupees, and told me I was welcome to a hundred if I required so much; for this good act I authorised him to open the sealed bag of money that arrived two days afterwards, and take out twenty. Putee Ram said there was no occasion for this, but that he would receive the money at Rampoor in December, either from my brother or me.

The Koonawurees pride themselves upon their country, and well know how superior they are to the other mountaineers. Not long since I asked one of the Rajah's attendants where he staid: he answered, "In Buree." I replied, "It is in Dusow, I believe?" "No," said he, with seeming scorn, "I know little about the people of that district: I am a Koonawuree, and live in Buree, of Utharabees."

It is only the natives of Koonawur that are trusted with money or any message of importance: most of the officers of court, and nearly all the attendants on the Rajah are from this part of Busehur.

The food of the people is bannocks of different kinds of grain, kitchen vegetables, and a great proportion of meat: their most usual drink is tea, and they occasionally take a dram of spirituous liquor, and at their festivals they indulge pretty freely.

DRESS.

The inhabitants are often extremely dirty, which seems to be natural to those of high mountainous countries; and it is not surprising, for when my brother and I were encamped at 15,000 and 16,000 feet without a tent, for several days in a frigid atmosphere, we frequently did not undress for a week; and when the skin was peeled off our hands and faces, we did not find it agreeable to touch water at the temperature of freezing for as long a time.

Notwithstanding the want of grain, there are no marks of poverty in the country, and the inhabitants are generally so rich, that when two of them belonging to the village of Leedung wished for an advance of 1,000 rupees to purchase wool for the British Government, the Wuzeer in charge of that place, said, he would go security for 10,000 rupees each person. This is by no means a singular instance; for although none of them have large fortunes like the merchants and bankers of the plains, yet the riches are much more equally divided, and the poorest people are never in want, for if even grain be scarce, as it often is, yet their large flocks furnish an inexhaustible store.

The people are as well clad as they can be, and seem to enjoy a much greater degree of comfort than any of the other mountaineers I have seen; their general dress is a frock of white blanket,*

* This blanket is called Sooklat, and is the same as Mr. Fraser's.—See Cloth.

often twice folded, reaching to the knees, and having sleeves, a pair of trowsers and girdle of the same, a cap of black blanket, and shoes, of which the upper part is woollen, and the sole alone leather. Every body has a steel for striking fire, ornamented with brass, hanging from his right side, and they commonly wear a hatchet stuck in their girdle, above which is tied a rope of goat's hair, neatly plaited and extremely strong, which they use in carrying burdens.

The dress of the women is much the same, and in front they have a brass clasp called Peechook, in shape like a pair of spectacles, but much larger; they also wear bracelets, ear-rings, and anklets of pewter and silver.

A garment of goat's hair, named Kheear, is sometimes used; it is not so warm as the dress of blanket, but it keeps out rain well.

EMPLOYMENT.

The Koonawurees are all traders, and their chief riches consist in large flocks of sheep * and goats, that furnish them with wool, which, together with raisins, they exchange for grain.

They lead a pleasant life. In November many of them come to Rampoor with wool, and a few go to the plains to purchase merchandise for the mar-

* Mr. Fraser remarks seeing no flocks of sheep. This is easily accounted for, because Koonawur is the principal grazing country, and most of the flocks of the lower hills are sent up there in summer; a number of sheep are likewise sent to the high lands of 10,000 and 12,000 feet near the passes, where there is excellent pasture. Mr. Fraser did not visit any of these places, so no wonder he saw no flocks.

kets of Garoo and Leh, and they likewise visit the fair at Hurdwar. Most of them go to Leh or Garoo in the summer months, in which countries they travel much at their ease, compared to what they do in Koonawur; none of them carry loads, for the roads are so good that all their merchandise goes upon horses, mules, asses, yaks, goats, and sheep; many ride upon horseback, and often run races on the way; others amuse themselves with the gun, and kill deer and hares, which they eat, and the skins of the former furnish them with leather for their shoes. The people who stay at home, look after their vineyards and attend to their flocks, which, for four or five months, are sent to pasturage high up on the mountains. The shephards are relieved regularly, and during their absence they live in small houses, named Dogree, or Shurnung, where they employ themselves in making butter. The situations of many of these Dogrees are uncommonly romantic, upon the sides of sunny banks, covered with carpets of the most fragrant flowers, or in sequestered dells, surrounded by huge mountains, towering to the skies; some presenting bare faces of granite, or craggy heights, threatening destruction to the peaceful flocks, whilst others are crowned with perpetual snow; the contrast of these with the dark forests of oak, covered with mosses and lichens streaming in the wind, interspersed with the light green foliage of the pine, and topped with yellow-coloured belts of birch and rhododendron in full bloom, form the grandest scenery imaginable. In summer the

climate of these delightful spots is charming, and it is here that the raspberry, black currant, and strawberry are found in the highest perfection, upon the verdant banks of the limpid streams, that descend from melted snow. In the cold season, the people occupy their time in weaving blankets, caps, and shoes, which are their only manufactures. They early begin to collect their winter stock of fuel and food for their cattle, which last consists chiefly of the leaves of trees, and they pile it on the tops of their houses.

AMUSEMENTS.

The people are fond of dancing and singing, and they have several annual festivals, which they celebrate with a degree of joy scarcely known amongst other Asiatic nations. The grandest festival is called Mentiko, which prevails throughout the whole of Koonawur; it is held in the beginning of September, but I could get no account of its origin. All the people who are able to move leave their villages, and ascend the nearest hill; they proceed slowly, making a circuit of several days, and this is a time of the greatest festivity; they adorn themselves with garlands and flowers, and sing and dance to the sound of music, which is much more melodious than the Hindoostanee tunes: they play at all sorts of amusements, run foot and horse races when the ground will admit of it, perform feats of agility, feast, and drink.

Their musical instruments are large and small trumpets, shells for blowing, drums and kettle drums; these are chiefly used to please the gods;

but during their holidays they play upon tambours, fifes, pipes, fiddles, and double flageolets, and many of their airs are very pleasing. They like to ornament themselves with wreaths of flowers, and you seldom see a person without some about his cap. In crossing the high passes, or after we had been encamped for some days on spots without vegetation, our guides seemed to hail with rapture the first flowers they saw; they pulled and stuck them into the rims of their caps, and farther down exchanged them for the rhododendron, or some other sweet smelling flower.

DISEASES.

The climate is salubrious and bracing, and from there being no regular rainy season, and consequently few noxious vapours exhaled from the earth, fevers are very uncommon. Some of the inhabitants are troubled with goitres, or swellings in the neck, which have often been attributed to drinking snow water, but this is very far from being the case, for, although the Koonawurees can get nothing but snow for some months in the year, they are not so subject to goitres as the people that live in the damp grounds, in the forests at the foot of the hills, where there can never be any snow water.

In winter the eyes are frequently inflamed by the reflection of the snow; and people travelling at this time protect them with large leaves, generally of the rhubarb.

It is when the snow has newly fallen, that it is most injurious to the eyes; afterwards it becomes solid with dust. In October, when I visited Sha-

tool after a heavy fall of snow, although I was not exposed more than two hours, yet the inflammation of my eyes was so painful, as to keep me from sleeping during a whole night. All my attendants, and the guides, were similarly affected; and two of the former kept groaning loudly the whole of the following day.

RELIGION.

The religion of the mass of the inhabitants is Hindooism, but they have no minute distinctions of caste. They either burn or bury the dead at some distance from the villages, where they erect grave-stones.

Some of them profess the Lama religion; but that properly belongs to the Tartars, who will be afterwards mentioned.

REVENUE.

Koonawur was always favoured by the Busehur government, and the assessment falls lightly upon the people, who are happy, contented, and in good circumstances. The cultivated land bears so small a proportion to the population, that it is scarcely taken into account, and the assessment is levied at the rate of from eight to twelve rupees upon each family, which is little in comparison to the wealth of the inhabitants.

The whole revenue of Koonawur is about 15,000 rupees, exclusive of sheep, goats, apricots, raisins, blankets, oil, and butter, the amount of which cannot be ascertained. The people are probably lightly taxed, because this is the only part of the

country on which the Busehur government can place any dependence. Most of the other districts, which were formerly ruled by petty chiefs, of whom there are many descendants still alive, would revolt upon the first favourable opportunity; and it was in Koonawur that the Rajah and Ranees found refuge and were supported, during the time the Goorkhalees possessed the other parts of Busehur. The hardy Koonawurees were almost the only soldiers; and by destroying the bridges, and throwing other obstacles in the way of the Goorkha army, they succeeded in giving them so much trouble, that the commander judged it prudent to conclude a treaty with them, in which he promised that no Goorkha would be allowed to enter Koonawur, on condition of their giving 7,500 Rs. annually, which sum was always punctually paid. The Koonawurees often pointed out with exultation the spot where they defeated Umur Sing's advanced guard, which was one of the reasons that induced the commandant to make peace with them.

VILLAGES, HOUSES, ETC.

The villages are in general large, and the houses spacious and even elegant. They are built of stone and wood, two stories high, and are either slated or flat roofed; the last, which is most frequent, is formed of layers of birch bark, and covered with earth. The houses have projecting wooden balconies, and are often white-washed with a shining kind of mica, which looks well. The detached houses have the appearance of English cottages. In some few parts they are wholly constructed of keloo wood,

are compact, and resemble water cisterns. The doors are often folding, and open inwards, and to the outside are fastened iron chains, the other ends of which are fixed to the balcony above; they are quite slack, and I could never find out any use for them.

There is a blacksmith and carpenter in each large village; but they are indifferent workmen, and for the construction of the temples, they get people from the lower hills.

The household furniture consists of little more than some keloo chests for keeping grain, raisins, and apricots, a weaving apparatus which is very simple, spindles for twisting worsted, back-baskets, skins for holding flour, butter, and spirituous liquors, brass and iron cooking pots, wooden plates, a stone mortar for expressing oil from the kernel of the apricot, a hand mill, a lamp or two, a smoking pipe, a tea-pot, and sometimes a few China cups and saucers. Bedsteads are almost unknown; and the earth is of broken granite, unfit for pottery, so they keep water and oil in vessels of different shapes and sizes, made of juniper wood, with iron hoops, and resembling those called cogs by the Scotch Highlanders.

TEMPLES.

The temples of the Deotas (Deities) are magnificent, and adorned with a profusion of costly ornaments. There are two or three in almost every village, and sundry miraculous feats are ascribed to the gods to whom they are dedicated, scarcely one of whom but has the credit of having removed a

vast rock or mountain, for the purpose of rendering the roads passable, or of some other like achievement. Each god has generally three distinct houses; one for himself, another for his furniture (these two are built of stone, and slated), and the third, which is constructed of wood, is small, well raised, open all round, and supported on posts: in this the god is placed on grand festivals.

The goddess in greatest repute is *Kalee*, in her most horrid form, to whom human sacrifices were offered at no distant period. I have heard of their taking place not more than twelve years since; and they existed at the famous temple of Bheemakalee in Sooran, where the Busehur Rajah resides in summer, at a later time, and were not finally abolished there until the British government got possession of the Hill States, in 1815.

Two people usually attend each temple; and on the mornings and evenings they beat kettle drums, and sound trumpets.

Great sums are expended upon the temples, which are often of cut stone; they are lofty buildings, visible at a distance, towering above all the other houses in the village. They have roofs in the Chinese fashion; and projecting balconies, embellished with neatly carved wooden flowers and fringes.

COINS.

The coins are rupees, both the common one of Hindoostan; the Moohumud Shahee, five or six per cent. better; and one current on the hills, only half the value of the former.

The Timasha, or Paolee, a silver piece of four-

pence, and a copper coin, called Dubwa, in value from a half-penny to a penny, according to the size. The Cowrie shells, so abundant in the plains, are unknown here as money, and they only use them as ornaments for their women. Commerce is chiefly carried on by barter.

WELLS.

The wells, for the most part, are built of hewn stone in form of inverted pyramids, descending by steps; they are not more than two or three feet deep, and are often shaded by trees or an arched roof. The springs are sometimes at the bottom, but more commonly issue from the side of a mountain, through wooden or stone pipes, not unfrequently carved into rude imitations of dog's, elephant's, or tiger's heads. The water is limpid and cool at all seasons, and my followers were always praising it.

There are a few mineral springs, impregnated with salt, iron, and alum, which may possess some medicinal qualities; I filled bottles with two kinds, to have them analyzed, but they were both broken.

LANGUAGE.

There are five different dialects spoken in Koonawur, but I have only got a vocabulary of three of them.

With the exception of compounds, which are easily distinguished, the words are monosyllabic or dissyllabic.

1st. The Milchan, or common Koonawuree, which is most generally used. The chief characteristics are the terminations, *ang*, *ing*, and *ung*, which occur very frequently, and might make a person suppose it was derived from the Chinese. These terminations sometimes form the only distinction between the Milchan and Hindoostanee: there are other differences, such as *sb*, *st*, *ts*, *sk*, at the beginning, and *ts*, *gs*, *ps*, at the ends of words. *Sh*, *z*, and *zh*, are very common, and they like these letters so much, that they generally change *s* into *sh*, and *z* into *zh*, when talking Hindoostanee, and these are sounds that can be pronounced by but few natives of India, unless Persian and Sanscrit scholars. The infinitives of the verbs end in *mig* and *nig*.

2nd. The Theburskud, spoken at Soongum, is very different from the Milchan, and the infinitives terminate in *bung* and *pung*.

3rd. The dialect used in Lubrung and Kanum, in which the infinitives of verbs end in *ma* and *na*.

4th. That spoken at Leedung, where the terminations of the infinitives are *ens*.

5th. The Bhoteea, or Tartar, which will afterwards be noticed.

The Milchan and Bhoteea are distinct tongues, and the same may almost be said of the Theburskud. The other two are dialects of the Milchan, and differ principally in the tenses of verbs, and cases of nouns.

A. GERARD.

Kotgurh,
28th June, 1822.

AN ACCOUNT

OF

KOONAWUR.

BOOK II.

AN ACCOUNT

OF

KOONAWUR.

REMARKS UPON THAT PART OF KOONAWUR INHABITED BY TARTARS, AND SOME OF THE ADJOINING COUNTRIES.

FACE OF THE COUNTRY.

THE upper parts of Koonawur, especially Hungrung, together with Chinese Tartary and Ludak, are arid in the extreme, and present a scene of desolation scarcely to be credited, unless by a person who has visited the country. The mountains are either granite, limestone, or clayslate of a crumbling nature, forming gradual swellings of gravel, and very rarely ending in peaks.

What a striking contrast there is between this extraordinary country and the lower tracts. Here seems to reign perpetual solitude, never disturbed by the crash of falling rocks. There is no stupendous scenery to attract the eye of the traveller; no bold crags, nor dusky woods of waving pines; no finely

shaded grottos, nor romantic valleys flanked by mural ramparts of granite, and scarcely a vestige of culture; all is a frightful extent of barrenness, with no interesting object to diversify the scene. Elevated plains and undulating hills, extend as far as the eye can reach, and, in Tartary, a person may travel for many days without meeting with a habitation. A solitary village, with a few scanty fields of wheat, barley, and ooa, fenced with gooseberries, and some poplars that are planted for the sake of their leaves, which are given to cattle, or, what is more common, an encampment of Tartar shepherds, with their black tents and flocks, but seldom interrupts the prospect, all else is a dreary waste, without a single tree, or even bush above a few inches in height.

Beds of several sorts of prickly shrubs, like furze, vegetate here and there, which give some parts of the country the appearance of a Highland heath, and strongly remind a Scotchman of his native land. In summer, the yellow bloom of the furze partially enlivens the view, but in October, every particle of vegetation is parched up, the leaves of the plants are reduced to powder, and the naked stalks, which are perfectly black, look as having been burnt with fire; the earth is often rent into small fissures, and no verdure is seen; there is something melancholy in beholding such an expanse of arid country, which is peculiarly striking from the degree of sameness it exhibits. I can never forget these scenes, which have made a greater impression on my mind than the loftiest towering points and snow-clad summits.

In traversing these wilds, where no abrupt peaks, wooded mountains, nor tumbling cataracts vary the prospect, the traveller feels an indescribable sensation of solitude, which perpetually haunts his imagination, and he thinks himself forsaken and forlorn.

In October, the chilling winds, entirely destitute of moisture, blow with irresistible fury and a horrid howling over the bleak mountains, filling the eyes with dust, drying up every thing exposed to their force, and freezing to death the unfortunate traveller who happens to be benighted on the lofty heights.*

In some places, 3,000 and 4,000 feet above the beds of rivers, the face of the country has the appearance of having been under water; there are heaps of rubble, decomposed felspar, and pebbles imbedded in clay and limestone. I never met with

* It is well known that cold alone does not cause death, for a person can endure it in a very great degree if unaccompanied by wind. At 3 P. M. I have seen the thermometer 22° below the freezing point at 18,700 feet, yet the cold was not very disagreeable; at another time the temperature was 4° above 32, but the wind was so very strong, that after standing ten minutes in the breeze, I was almost frozen, and could not use a pen for two hours afterwards, from the numbedness of my hands. In September, 1820, my brother James lost two of his servants in crossing Shatool Pass, and this arose from the violence of the wind, for I afterwards saw the body of one, not above 13,300 feet: when he died, which was at 1 or 2 P. M., the temperature could not have been below freezing, as it was 27° in the crest of the pass, 2,200 feet higher, about the same time of the day; the wind, however, was very violent.

In December of the same year, one of my servants perished at 7,000 or 8,000 feet; the thermometer then was 5° below the freezing point, but the wind drifted the snow with as much fury as any hurricane I ever saw in Scotland. At this time my brother James and myself made a march of twelve miles, and the people with the baggage ran almost the whole way, being well aware of the danger of delay.

shells of any kind, but found ammonites at 16,300 feet.

There is plenty of excellent limestone on the upper parts, but the people are ignorant how to burn it into lime; this is of little consequence, where fuel is so scarce, but I thought it might be useful at Soongnum, where there is more wood, so I taught the inhabitants the process, for which they were thankful, and said they would in future use lime in the construction of their buildings.

CLIMATE, SEASONS.

At the greatest altitudes there is scarcely either spring or autumn; and the extreme rapidity of vegetation in these upland regions is astonishing. The latter part of June, July, and August, are the only months required for the growth of the prickly bushes; in these the leaves sprout, flowers blossom, and seeds ripen. In the beginning of August, at 15,500 feet, the pods were formed and full; and a month later the seeds would be dispersed.

The grains, which are wheat, barley, ooa, and phapur, together with peas and turnips, are sown at 12,000 and 13,000 feet in April, and reaped in August and September.

"What a happy climate!" exclaims Capt. Turner, in speaking of Teshoo Loomboo; and Mr. Saunders repeats the same expression more than once; but it has its rigours as well as its charms. In July and August, which are the hottest months, the mean temperature at 16,000 feet seems to be 44° or 45°; but even at this season, the thermometer

at sun-rise ranges from 27° to 30°, and at this time I observed a very heavy dew on the plants. At mid-day, however, the sun was powerful, and the thermometer in the shade, exposed to the wind, rose to 62°; and under the single fly of a tent, it even ascended to 77.5°. The winter must be proportionably severe; and it is not easy to guess what the greatest degree of cold may be at 16,000 feet. The mean temperature, in latitude 32°, should be 8° or 10° under the freezing point; and the extreme cold is probably thirty degrees lower; but this temperature is endured by the shepherds, who always live in tents.

In summer the sun generally shines bright throughout his course, and the atmosphere is not loaded with dense vapours as in the lower hills. With the exception of March and April, in which months there are a few showers, the uniform reports of the inhabitants represent the rest of the year to be almost perpetual sunshine,* the few clouds hang about the highest mountains, and a heavy fall of snow or rain is almost unknown.

The depth of snow is usually a foot, and two are very rare. It is not difficult to account for this, and it may be noticed that the outer Himalaya, although in general not so high as the interior ranges, is the most formidable barrier, and has by far the greatest quantity of snow. This chain, which on an average may be taken at 18,000 feet,

* As a proof of the absence of rain and snow, I may mention that the houses in Speetee are half-built of stone, with the upper story of unburnt bricks; in Ludak and Chinese Tartary they are of the same construction, or more commonly entirely of the latter material, and the people say they are just as secure as stone buildings.

is quite sufficient to keep out the rains which inundate lower Hindoostan for three or four months, and by reason of the great height of the plains of Tartary, the very few streams and consequent aridity of the soil, little evaporation can arise to form clouds, and the people say the highest passes might be traversed even in the middle of winter, were it not for the severe frost that prevails in these serene regions under a clear sky, which is made more keenly sensible, from the great scarcity of firewood.

The road from Shealkhur to Ludak is travelled throughout the year, and indeed January and February are the usual months in which the Koonawurees visit Leh, the capital; for most of them go to Garoo in summer, during which season only the roads are practicable; the vast altitude of the pass between Koonawur and Ludak may be inferred from the height of the bed of the Speetèe river being 10,000 feet under Shealkhur, beyond which the road leads along a branch of it for eight days journey to its source in Chumorereel, and crosses the high range fiftèen or twenty miles further on. This lake, upon a moderate computation, may be taken at sixty miles from Shealkhur, in a direct line, and if the fall of the river upwards, be reckoned at one hundred and ten feet * for each horizontal mile, which is what I found it in Hungrung in a space of twenty miles, Chumorereel will be 16,500 feet. It is, however, likely to be more, for I believe there are few rivers which rise amongst mountains

* This is just double the fall of the Sutluj at twice the distance from its source.

that are not more rapid near their sources than farther down. I have invariably found this to be the case, except in the district of Speetee, which had every appearance of having been once a sheet of water; and the fall of the Paratee, where I last saw it, six miles N. E. of Shealkhur, seemed nearer one hundred and fifty feet than one hundred feet per mile.*

The transparency of the air on lofty spots at mid-day, is remarkably beautiful; it is of the deepest azure, and blacker even than the darkest night. The sun appears like a radiant orb of fire, without the least haze; and the moon, which I have often seen rise, did not enlighten the atmosphere, and the direction where we expected her could scarcely be distinguished until her limb came in contact with the horizon.

At night, when I was employed in making astronomical observations, which was rather an uncomfortable occupation at a temperature of 18° and 20° of Fahrenheit, the stars shone with the greatest brilliancy, and those of the galaxy could almost be counted.

When I was encamped at 16,200 feet, the gilded summits of the elevated chain that trends along the left bank of the Indus, had a very grand appearance; a few streaked clouds hung about them, which, being illuminated by the rays of the rising sun, shewed a beautiful diversity of colours, vieing

* The rapidity of the large rivers, such as the Sutluj and Para, cannot be expected to increase like that of the Teedoong and Taglakhar, which have an inclination of three hundred and three hundred and fifty feet in the mile, since the country through which they flow is not of so rugged a nature.

in splendour with the most vivid rainbow, and surpassing in lustre the brightest burnished gold.

I usually put up the transit at the high places, and the power of thirty shewed stars of the fifth magnitude at any time of the day, when not too near the sun. At Murung, 8,000 feet in the deep-worn valley of the Sutluj, stars of the fourth magnitude were visible at mid-day with the power of thirty; whilst at Soobathoo, 4,200 feet above the level of the sea, it required a power of forty to make those of the fourth magnitude visible thirty or forty degrees from the sun. The air was not always of the deepest azure colour at the greatest heights, and I have seen the atmosphere clearest at 13,500 feet in the glen of Shatool during the latter end of October; at this time I almost thought stars of the first magnitude might have been discovered with the naked eye at mid-day, but the air appeared darker than it really was, from my being surrounded by towering mountains of a dazzling whiteness.

PRODUCTIONS.

The grains have been already noticed;* ooa grows highest, and it even ripens at Koongloong, 16,000 feet, although its upper limit in Koonawur is not above 13,600 feet. Apricots are found in sheltered situations. The superior limit of this fruit, as far as has been observed, seems to be

* The Tartar husbandmen have a custom similar to those of some of the Scotch farmers, who plait the first corn cut three-fold, and fix it over the chimney-piece till next harvest, when it is renewed. The Tartars use three ears of barley, which they paste outside above the door. At Nisung there was not a house in the village but was ornamented in this way.

somewhat below 11,000 feet. It does not thrive within the Himalaya farther east than Keookh, in longitude 78° 47′. Poplars, the leaves of which form food for the cattle, are planted near the villages. 12,000 feet is the highest that have been seen, but they are said to grow to a greater elevation in Ludak, although they do not thrive at Peenoo, 12,200 feet. The natural productions of the country are prickly bushes of several sorts, aromatic shrubs, and a plant resembling broom. One kind, which is most common, is called Tama,* and the pod, flower, and bush altogether, are like furze. This, which forms most part of the firewood, flourishes even above 17,000 feet, and the highest vegetation, of which I had no opportunity of gathering a specimen, borders upon 18,000 feet. I obtained its limit after several trials, by observing the barometer, when the highest on the opposite range, which was separated from me by a deep dell, was upon a level, which I ascertained by the theodolite.

The prickly bushes grow best on the bleakest places, in a sort of crumbling limestone; and these plants are wonderfully adapted to this extraordinary country, for did they extend no higher than on the outer Himalayan chain, where the most stunted plants do not rise above 13,000 feet, vast tracts of elevated land would be a perfect wilderness, uninhabited either by man or beast. Fifteen thousand feet, in latitude 32°, according to the generally received

* This is the same as the Tamak or Damak of Mr. Fraser. The Tartars often add *k*; for instance, Ropa, the name of a village, is called by them Ropak, and they have a way of prefixing *s* to some words as Pooee-Spooee, Peetee-Speetee, Tango-Stango.

theory, should be veiled in impenetrable snow;* but here it is very different, and numerous droves of cattle feed upon the thinly scattered herbage, at least 2,000 feet higher, where the sun-rise temperature must be always several degrees below the freezing point.

TARTARS.

The Tartars are called by the inhabitants of the lower parts, Zhads, Bhoteeas or Bootuntees, and their country is often named Bhot and Bootunt;† but the common appellation of that portion under the Chinese authority, is called Cheen-Maha-Cheen, by which word is meant the whole tract between Lahassa and Koonawur.

Gnaree is the country betwixt Busehur and Mansurowur, and the people call themselves Keao. Zhad is reckoned a term of reproach, and is applied by the Hindoos to those who eat bullock's flesh. Oondes, as Mr. Moorcroft names the tract, comprehending Garoo and Daba, is only used by the people of the plains, and signifies the land of wool.

Tartar or Tatar is unknown here, and so is Tibet. Captain Turner says the Tibetans call

* On my route to Bekhur, four of my camps were from 14,000, the lowest place, to 16,000 feet, above the sea; and three of them were in the bed of a river: no snow was crossed on the road, even at 18,000 feet. Bekhur is fifteen days journey from the source of the Sutluj; so, with the exception of the bed of that river, the general level of that part of Chinese Tartary must be between 15,000 and 17,000 feet; yet the Tartar shepherds reside there in summer for several months.

† Bhot, Bootunt, or Tibet, is often confounded with Bootan, which appears by Captain Turner to comprise the hilly country south of the Himalaya, or the Daeb Rajah's country, which lies between Teshoo Loomboo and Lahassa and the plains. It is certain that the lower hills are not called Bootan, west of the Tons.

their own country Pue Koachim; and Bootan is named by them Dukba. I have heard a word little different from the former, but only twice or thrice; and Bootan is probably corrupted from Bootunt. Tibet is understood by very few people; but the Kashmerians apply it to Ludak.

The Tartars are very different in appearance and manners from the inhabitants of lower Koonawur; and all those of Busehur were formerly under the Chinese. There are seven villages of them on the left bank of the Sutluj, which used to be a scene of contention between these two states; the Busehurees were the aggressors, and the Chinese retaliated by bringing an army at three different times as far as Murung, and plundering some of the adjoining places. Both parties, about ninety or a hundred years ago, found it to their mutual advantage to conclude a commercial treaty, since which time there has been peace and a great deal of intercourse between them. The above seven villages were afterwards given up by the Grand Lama of Lahassa, for the support of Tuzheegung Temple:* they contain fifty-two families, and the whole of Hungrung is inhabited by Tartars. This district originally belonged partly to Ludak and partly to the Chinese. The Ludak portion was reduced by the Busehur government about one-hundred-and-fifty years since, and nearly at the same time the Chinese gave up their share, but for what reason I know not. The Tartars of Koonawur are not so

* This Temple, although in Koonawur of Busehur, and not very much celebrated, is still partly supported by the Grand Lama of Lahassa. The Temple is situated on the right bank of the Sutluj, at the height of 12,416 feet, and it is attended by a few Lamas.

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stout as these farther to the eastward, and have less of the Chinese features. The others are muscular, well made, and tall; I saw few under five-feet-ten, and many were six feet or more; their strong athletic forms were remarkably contrasted with the puny diminutive figures of my attendants, several of whom were inhabitants of the plains. Their countenance is ruddy, and they have small oblong eyes, high cheek bones, thin eye brows, and very few have either mustachios or beards, which they admire much.

Many of them, especially from twelve to eighteen years old, are extremely handsome, of a very prepossessing appearance, and fine specimens of the Tartar youth. They have a degree of openness and frankness of manner which is very pleasing; and they possess none of the timidity peculiar to the natives of Hindoostan. I did not like them at first so well as the Koonawurees, but they improved on farther acquaintance with them and their language, and I now think them by far the finest race of people in the hills, and much superior to the inhabitants of the plains of India.

When I reached Nisung, there were none but women and children in the village, all the grown-up men having gone to Garoo for salt and wool. When I spoke of visiting Bekhur, the mothers pointed out their most intelligent sons to show me the road, with a degree of confidence that cannot be surpassed. They had no hesitation in trusting their children amongst fifty or sixty people of another country, to whom they were utter strangers; and I am glad to say their confidence was not misplaced,

as the guides became great favourites amongst all my servants. I often had boys of ten and fifteen years old to point out the way; and three of that age accompanied me for ten days without the slightest mistrust, although there was not a single Tartar among my followers, neither of whom nor myself could talk a word of their language, nor understand what they said without the help of a vocabulary. These three lads were very smart, and one of them surprisingly so; for he was not only quick at comprehending my meaning, but when I did not ask a question properly, he instantly put me right in regard to the pronunciation and grammar.

I remember, with pleasure, the happy hours I have passed with these Tartar youths, whose enlivening conversation and eager desire to make me understand their answers, beguiled the weariness of many a tedious march.

They are of a mild and benevolent disposition, very far removed from the ferocity commonly attached to the character of a Tartar. I have had many instances of their humanity. At Peenoo, in Speetee, where I was confined to my bed for two days with rheumatism, I never experienced more attention; I was a stranger to them, and the first European they had ever seen; the moment they heard I was unwell, some brought Nerbissi (Zedoary), which they reckon a sovereign remedy for most complaints; others came with sugar and spices; whilst a third party were busily employed in making tea: every one seemed desirous of shewing me some kindness, which was rather trouble-

some, but well meant. They were not, however, intrusive, and did not stay a moment longer than I wished. At this time I was negociating with the chief person of the place to be allowed to return by Taree Pass. This man shewed a degree of firmness that I could not help admiring, although it vexed me; he said his instructions on that head were so positive, that he dared not disobey them; and 150 rupees, which I sent him, did not alter his determination, and he returned the money. He replied, "You are welcome to goats, sheep, and blankets, but you shall not pass by this route; we will post ourselves on the road, but you have a sufficient number of people to force the passage, for we will not fight; we, however, trust you will not attempt it without permission."

This person, who was styled Lafa, visited me twice, and we exchanged silk scarfs, which is an invariable custom. He brought a present of a couple of sheep and some other things, for which I give him a full equivalent. He was inflexible in his determination, but we parted on the most friendly terms, and he even carried his politeness so far as to send four people with me, for no other purpose than to see me safe beyond a dangerous part of the road, where we were obliged to use ropes.

The Chinese Tartars, on this remote frontier of their vast empire, are just as vigilant respecting the non-admission of strangers as their countrymen at Pekin: no sum of money, however great, will bribe them to infringe the orders of their superiors. Last year I reached the limits of their country in four different quarters, but was not allowed to advance

a step farther; the same occurred in 1818, when my brother and I visited Shipke, and were the first Europeans they had ever seen.

Since Messrs. Moorcroft and Hearsey reached Garoo and Mansurowur, and more especially now that the former gentleman has penetrated to the capital of Ludak, they have become doubly watchful; and lately, two pilgrims on their way to make the circuit of Mansurowur, were stopped at Shipke, being taken for Europeans in disguise.

The Court of Ouchong, or Lahassa, have sent the most particular instructions to all the frontier posts, to prevent, if possible, Europeans from passing the boundary, but if that cannot be done, and they arrive at the first village, they are not to be supplied with provisions. This last injunction was so far attended to, that when I talked of proceeding onwards, I could not get grain at any price; but when I mentioned my intention of returning, they generally brought me plenty of grain, and said, that although the commands of the Garpun, or Governor of Garoo, must be respected, yet we should meet and part on amicable terms, by an exchange of presents. This good trait in their character was particularly exemplified when I proceeded two-and-a-half miles beyond Changrezhing, where the Chinese stopped me. I had no object in staying longer than to observe the sun's meridian altitude, and when I began to return, they seemed greatly dissatisfied, and strongly begged of me to remain, as they had sent to the nearest village for a sheep, otherwise they must think I parted from them in displeasure; they met me with an air of openness and good

humour seldom equalled, and I had some difficulty in persuading them that I left them on friendly terms, and they were not fully convinced of this until after my return to camp, when I accepted of a fat sheep, for which I recompensed them with several pounds of dried tobacco.

Notwithstanding their suspicion of strangers, I found the people communicative enough: they answered all queries respecting their country without reserve, and I was thus enabled to verify the accounts of Mansurowur and the Great Rivers, which I received from the Koonawurees, and I found them to agree very minutely.

The Tartars are the very reverse of quarrelsome, and their whole conduct was entitled to my regard; for at two places, Zeenchin and Changrezhing, although they had purposely left their houses to arrest my progress, yet they were quite peaceable, and so far from being disposed to dispute my passage by force, not one of them had arms of any kind. They thought their only mentioning the strictness of their orders, was sufficient to prevent me from advancing; and, although I remonstrated against them, yet from seeing the degree of confidence they placed in me, I directed my people not to go a single step beyond the limit they prescribed. Cheating, lying, and thieving are unknown, and they may be trusted with any thing. They have the nicest notions of honesty of any people on the face of the earth,* and pay an inviolable regard to

* My brother Patrick has often advanced many hundred rupees, without the least security, to Tartars who reside beyond Mansurowur, for the purchase of wool on account of the British Government, and these people have

property. I have been encamped at Shipke and Zeenchin, and I was eight days in Speetee, with between fifty and sixty loads of baggage lying about in every direction, many hundred yards from my tent, and I never missed the smallest article, although I had no sentinel, nor even a single armed follower, to intimidate them.

I had former experience of their character, which I depended upon so much, that when I left Murung for Bekhur, I was determined to put it out of the power of my people to cause any serious affray, which I thought possible from having so many followers who did not understand the Tartar language, by ordering the only sword amongst my servants to be left behind.

During the two days I encamped on the elevated table land of Zeenchin, upwards of 16,000 feet above the level of the sea, I was surrounded by hundreds of Chinese Tartars, and, although I believe there was scarcely an article that was not handled by fifteen or twenty people to satisfy their curiosity, I never lost the most trifling thing, and it would have been easy enough at night, to have carried off half of my baggage without being discovered; and indeed they might have robbed me of almost the whole of my property, for the people with me had never slept upon so lofty a spot, and they suffered so much from cold, that I am confident an alarm of thieves would not have induced them to move.

always fulfilled their agreements. The inhabitants of the Hill States across the Sutluj, on the contrary, will not pay for articles of British manufacture which they have purchased.

The Tartars are hospitable and obliging: they used to take pleasure in assisting my servants over the bad places of the road, and relieving them of part of their loads. They offered me sheep and blankets, for which I always endeavoured to give a double return: dried tobacco was the most acceptable present: they often asked me for some, and I had an opportunity of gratifying their wishes, having several loads of it. During a march they always filled the pipes of my servants with tobacco, and when we reached a Tartar village, we were invited to partake of refreshments, such as a dish of tea, a dram and apricots.

A person has only to signify his wish to get whatever he wants. In 1818, when my brother James and I visited Shipke, we were supplied with grain, for which they did not seem to expect a recompense, and on our departure my brother pointed to a shawl goat, when immediately half a dozen people surrounded, caught, and brought it. Our baggage had left the place, and we had no money about us, so the only return we could make, was a gilt button, which attracted their fancy.

This shawl goat, together with several others, was taken to Soobathoo; some of them lived two years, but they died one after another, mostly during the rainy season; so it is probable, moisture, of which there is scarcely any in Chinese Tartary, is injurious to them.

They are very inquisitive and curious, and were constantly asking questions about the reflecting circle, sextants, barometers, and the astronomical telescope; the latter pleased them most, and I had

frequently to shew the same objects to thirty or forty different people.

They were amused at observing the revolutions of the second hand of the chronometer, but did not know what to think of the transit; for although I shewed them several stars in the day time, yet I could but imperfectly explain it, and it is likely they looked upon it as a deception. Putee Ram, the intelligent inhabitant of Soongnum, however, quickly comprehended it: at first he asked how the stars moved from west to east, but was convinced of the contrary, when I shewed him people passing before the telescope. Venus in form of a crescent looked very well, and several persons called out it was the moon.

From my remarks upon the Koonawurees * and Tartars, it will perhaps be thought I have taken too favourable a view of their character; it may be so, as I have seen much of the natives of the plains, and have often been disgusted with their perjury and deceit. I mention, however, only what has fallen under my own observation; there may, no doubt, be exceptions, but I have never discovered any. I parted from the Koonawurees and Tartars with regret, and since my return I have often wished myself back amongst them and their secluded country.

DRESS, &c.

About Bekhur and Shipke the people are clothed with warm white blankets, called Sooklat, and their

* I am happy to find that Mr. Fraser gives the Koonawurees the same character that I have done.

dress resembles that of the Koonawurees; they all wear stockings and boots; the former of white woollen stuff, and the latter of two colours, the lower half red, and the upper tartan blanket, the shoe part is leather, the sole forms a considerable curve, and the boots are tied below the knee with a garter; they almost all go bare-headed, even in the coldest weather, with their hair plaited into numerous folds ending in a cue of two or three feet.

They smoke constantly, and every one wears a pipe stuck into his girdle; a steel, ornamented with brass, for striking fire, called Mepcha, and a knife about six inches long, in a silver, brass, or pewter case, often beautifully adorned; the handle is silver, ivory, or bone, and sometimes agate. I saw one of this last sort so finely carved, that the person to whom it belonged valued it at 300 rupees.

The pipes, which are named Khungsa, are of iron, inlaid with silver, of about eighteen inches long, and in shape exactly resembling those used by labourers at home; the cup is generally silver. The Mepcha is made of fine steel, and the part for holding it is of leather, with a bag for the flint and match, studded with brass or silver nails: it hangs from their dress by a metal chain. In travelling, I adopted the plan of carrying a pipe and steel, and most of my servants did the same; at first I used a flint and match paper, but I afterward exchanged the latter for the flower of a plant that grows near the snow; as with it, and a piece of quartz, the Koonawurees and Tartars were much more expeditious at striking a light than myself; this flower takes fire as instantaneously as tinder, and there is

seldom occasion to strike the flint a second time. Every body carries a small pouch of leather, or goat-skin full of pounded tobacco.

The women, who are almost as stout as the men, wear a long gown, and go bare-headed, with the hair hanging loose on all sides: many are good looking. I saw upwards of 100 at Shipke, and nearly as many in Speetee, who came in crowds to see me; the whole of them were literally almost weighed down, and groaning under a load of ornaments, such as immense anklets and bracelets of silver or pewter, heavy ear-rings, metal chains of various kinds, beads of silver, precious stones, coloured glass, and cowrie shells strung around their necks, ankles and arms, and attached to different parts of their dress.

The Tartars of both sexes are very fond of ornaments, and they wear as many as they can afford to purchase; some laying out large sums upon their pipes, knives and trinkets of all sorts; they have necklaces, upon which are strung large irregular pieces of a yellow substance called Poshil, which looks like amber, and when rubbed attracts feathers; they have beads of coral and other precious stones, which resemble rubies, emeralds, and topazes, and the men often wear bracelets and ear-rings, and have tassels of red beads hanging from the back part of their caps.

The road to Ludak, as I have before mentioned, is passable in the middle of winter, and is never shut by snow. I heard such frightful accounts of the frost on this route, that I was desirous of seeing how the people clothed themselves in their journeys,

and next day Putee Ram made his appearance in his winter dress, which was so heavy that I scarcely thought him able to walk. This was a garment of lambskin called Lakpa, with sleeves; the fleecy side was inwards, and the exterior covered with Sooklat, a kind of warm blanket dyed blue. He had trousers of the same, long woollen stockings, and above them the usual kind of boots, the foot part stuffed with two inches of wool, and gloves of thick flannel reaching above the elbows: in addition to this he had a blanket round his waist, another thrown on his shoulders, and a shawl wrapped over his cap, and part of his face; such, he said, was the usual garb of a traveller in the winter season, and that he was always accompanied by a mule load of blankets and another Lakpa, all of which were required at night, when he was obliged to sleep upon the snow.

They are very fond of horses, and you find them running loose and grazing in large droves; even the poorest person has one or more, and where the roads are good, every body is mounted. The Ghoont or hill breed of horses, is generally small, strongly made, hard-mouthed, and sometimes almost unmanageable. In ascending hill faces, or passing along the declivities of mountains, it is best to let them have their own way, for in an intricate passage they often shew more sagacity than the rider; their common pace is a kind of amble, and they stop every now and then to breathe, when no application of the whip will move them; they are sure-footed, and sometimes halt at the edge of a precipice, to the terror of the rider; they are not so quick in ascending hills as the low country horses, but they

descend with double the speed, and endure great fatigue.

I saw a Ghoont cross a rapid torrent by a wooden bridge of one plank scarcely one foot and a half broad; the owner said there was not the least danger, and requested me not to dismount: but I was of a different opinion.

The finest breed is produced in Ludak and Lahoul, one of the dependencies of Kooloo. In Hungrung there are a good number, and in summer they feed high on the short grass upon the mountains, and I have seen them, yaks and sheep grazing at 17,000 feet; they are let loose when not required, and are often difficult to catch.

Neither the Tartars nor Koonawurees know what a coss is, and they compute distances by the stage, half-stage, gun-shot, and bow-shot, which, in small spaces is certainly a very vague method; but, in intervals of twelve or fifteen days, this mode is capable of a tolerable approximation, especially if an account of the nature of the road be obtained: and I have had a pretty good proof of this in distances of four or five days journey.

The food* of the people is almost wholly flesh, for even part of the little grain produced in the country is exported; and most of the rest made into an intoxicating liquor, named Chong. The Tartars, as well as Koonawurees, like the Scotch Highlanders, take their dram of spirits in the cold

* When travelling, even in a populous country, the Tartars and Koonawurees always take two or three days supplies, which generally consist of parched grain, in a goat's or kid skin tied on their back, and they eat their meal half way on the bank of a stream.

mornings; and in their long journeys over the bleak mountains, where water is frequently not to be got until they reach their encamping ground, they take a dish of tea before starting, which, they say, is an excellent preventative against thirst. The tea* is purchased at Garoo, and comes from a long distance on the S. E.; it has little flavour, and they prepare it by an infusion of boiling water, and use butter, salt, spices, and a little meal, instead of milk and sugar; they stir it about with a stick, resembling the kind used in India for spruce beer. The tea-pot is of pewter, exactly like ours in shape; and the tea is poured out into China cups, or what is more preferred, bowls, of a beautiful marled kind of wood, lined with silver.

During my stay at Soongnum, Putee Ram insisted on bringing me daily tea, prepared after the Tartar fashion, which tastes like soup, and I took a great liking to it. The Tartars drink it in large quantities; and when they arrive at their encamping ground, their first occupation is to make the tea: they always offered me a cup, which I seldom refused. When a person reaches a Tartar village, he is asked to take a dish of tea, which is kept ready most part of the day.

SHEPHERDS.

The high country between Koonawur and Garoo, together with the part of Ludak, is inhabited by shepherds, called Dokpo, who dwell in tents, do not

* Mr. Fraser says the leaves of the tea are eaten, but I asked Putee Ram particularly, and he assured me that he never heard of such a custom.

cultivate the ground,* and subsist by their flocks, Here permanent habitations are rare, and there are none in the district called Choomoortee, which is put down in the maps as the name of a village only. Houses are so uncommon in this quarter, that one tract, where they are more usual than tents, is denominated Yool-Choomoortee; the first word signifying village, as being something remarkable.

The shepherds roam about from place to place, wherever they can find water and good pasturage for their numerous herds of sheep, goats, yaks, and horses. I saw several of the tents, which are comfortable enough. They are made of black yak's-hair blankets, and are twenty or thirty feet long, ten broad, and six or seven high; they are double poled, with round ends, and the tent ropes are of goats' or yaks' hair.

The sheep are large, hardy, and are used in transporting merchandise: they take twenty pounds weight over very bad roads. I had a large flock of them to carry grain from Ropa to Speetee, and they always reached the encamping ground at the same time as myself, and outstripped the loaded people by many hours.

The fleece of those of Chinese Tartary, which is called Beangee, is long, fine, and extremely warm: it is now brought in quantities by the Koonawurees to Rampoor for the British Government.

The shawl wool Lena, so well known, is the produce of the goats of the same country.† It used to

* It would, perhaps, be more proper to say, cannot cultivate the ground, which is too elevated and arid for grain of any description.

† The Shawl wool is the fleece of the goat, next the skin only; the outer

be a prevalent opinion that these goats were found in Kashmere; but that celebrated valley is far too warm and damp for them. The best shawl wool is produced in the vicinity of Garoo, Mansurowur, and the elevated lands to the eastward.

According to some old agreement which Mr. Moorcroft mentions, the shawl wool all went to Ludak, and from thence to Kashmere; and it is even taken to that place from so great a distance as the eastward of Teshoo Loomboo. The Koonawurees were not allowed to purchase it openly, but they smuggled it in small quantities of two and three pounds each person. However, since the British have thought it worth their while to buy it, the Chinese have not been so scrupulous, and they now sell it to the highest bidder. Last year one person from Namgea Lache, a country on the bank of the Brahmapootra, eighteen days journey S.E. of Mansurowur, brought about twelve hundred weight of it; and the trade is on the increase.

The Koonawurees also find it to their advantage to extend their commerce in wool, and have lately been improving some of the most frequented roads through their country. This last year I noticed several places that were formerly scarcely practicable for travellers, which had been repaired so as to be passable with some difficulty by loaded sheep, several of which were brought in 1820 to Rampoor, which had scarcely ever been attempted before. A few of them were lost by tumbling down precipices;

coat is coarse hair, and the two colours are white and light brown. The dogs of Tartary have also a soft down below the hair, very little inferior to that of the goats.

but the people told me they intended to make the roads better, although they would require much time and frequent repairs, from being destroyed by the falling rocks.

In this elevated region, wild horses, Keang, asses, Goorkhur, and yaks, Dong, besides innumerable hares and deer, are plentiful; all of which are killed and eaten by the Bhoteeas. The wild yaks are larger than the domestic ones, and are all black; they go in large droves, are extremely fierce, and sometimes dangerous to travellers. Captain Turner mentions the wild horse under the name of Goorkhaw; but he says it had long ears, and he only saw it with his glass at a distance, so it was probably the ass, which is called either Goorkur or Goorkha.

There is a sect of wandering Tartars called Khampa, who are in some respects similar to the Jogees of Hindoostan. They visit the sacred places, and many of them subsist wholly by begging. Some are very humorous fellows; they put on a mask, perform a dance, singing and accompanying it with a drum, or they play, sing, and dance, all at once, holding the fiddle above the head, behind the back, and in a variety of other strange positions.

Since the British Government have got possession of the Hills, Khampas come down in crowds to visit the holy places to the westward.

RELIGION.

The religion is Lama, and they are very superstitious, paying great regard to lucky and unlucky days. The Lamas in Koonawur are of three sects,

Geloopa, Dookpa, and Neengma; but I could not hear of that called Shammar by Captain Turner.

The Geloopas or Gelookpas are reckoned the highest; since the heads of their religion at Teshoo Loomboo and Lahassa are of the same sect. They wear yellow cloth garments, and caps of the same of various shapes.*

The Dookpas are dressed indifferently, but have red caps; and the Neengmas wear the same, or go bare headed: the two former do not marry, but there is no restriction on the Neengmas.

The Lamas admit proselytes at all ages, and any person can become a Dookpa, Geloopa, or Neengma, at his pleasure; they are commonly initiated at the age of 7 or 10, and the Chief Gelong of Kanum said he would admit me, although I came from a different country.

All the Lamas can read and write, and I never saw one who did not instantly recognize the few sentences in Captain Turner's Thibet. In the upper parts of Koonawur it is common for one person from each house to be educated to the church, which is likewise the case in Thibet.

The Lamas wear necklaces of two sorts of beads, Raksha and Tha, the seed of some plant; these necklaces contain 108 beads, which is reckoned a sacred number.

There are two other sects peculiar to Chinese Tartary, Sakeea, who wear red, and Deegooma, yellow caps.

The Lamas assemble in their temples twice or

* The yellow is the favourite colour of the Emperor of China.

thrice a day, to perform worship, which they accompany with a band of musical instruments.

The Gelongs, monks, and Chomos, or Anees, nuns, are the heads of the Lamas, and have nothing to do with worldly concerns, but employ themselves in chanting hymns, and writing and printing sacred sentences from blocks of wood. The nuns pass most of their time in reading, and do not write so much as the Gelongs.

The Lamas and Gelongs, who profess celibacy, reside in a monastery called Ghonpa, or Goomba, and the nuns in a convent named Chomoling; these usually form distinct divisions, and are apart from the other houses of a village.

In Tibet, the chief of a monastery is called Lama, which is the highest title, and the inferior orders are styled Gelong. Here it is different, for most of the clergy are named Lama, or, as it is more commonly pronounced, Lamba; and the heads of the convents of Kanum, Lubrung, and Shealkhur, whom I have seen, are denominated Gelong and Gooroo.

In Koonawur, Gelongs are not common; there is seldom more than one in the largest villages, except Shealkhur, where there are eight or ten Geloopas, improperly called Gelongs, but not entitled to such a distinction.

The Gelongs wear white trowsers, a long red and yellow cloth garment, and either go bareheaded or have head dresses, commonly yellow, higher than the rest, and shaped like a cone. I have also seen some with hats like ours, and others resembling those of Quakers, of a French grey colour.

The nuns are clothed in red, and have hats like our round ones, of yellow, trimmed with red. Neither the Gelongs nor nuns smoke tobacco, although the Lamas do: neither of them drink spirituous liquors.

You scarcely ever see a Gelong but he is singing; if you ask a question, he answers it, but immediately resumes his song, which is generally the favorite invocation, "Oom mane paeemee oom," as Captain Turner spells it, but the last word is here pronounced "hoong."

I have often conversed with Gelongs, but had not so much communication with the nuns, who are generally reserved, shy, and seldom leave their convents; although I have constantly observed them staring, laughing, and making signs to me from their balconies.

At Soongnum, I had an opportunity of seeing a great many Lamas and nuns, for those belonging to six populous villages paid their respects to me; there were at least eighty of the former and fifty or sixty of the latter. I remarked many handsome youths amongst the Lamas, but not a single good-looking nun out of the whole number; and Putee-Ram shrewdly observed, that the ugliest women, having but little chance of getting husbands, are chiefly those that retire to convents.

They sing a song which is agreeable enough; it is begun by the chief Gelong repeating several sentences, and now and then they all join in a chorus, which is slow, soft and harmonious, but rather of a melancholy cast; the chorus becomes more frequent, till at last they all sing for a considerable

time. It put me in mind of a Scotch air, and, notwithstanding there were at least 120 singing together, they kept the time with the greatest precision. In their public worship they use cymbals, tambourines, immense brass trumpets, which draw out in five or six pieces to the length of seven or eight feet; very large drums, fixed on a wooden frame, and the thigh bone of a man pierced with holes, which sounds like the sea conch, or sacred shell of the Hindoos.

The Grand Lama of Lahassa, called Geabong Rimboche, who resides in Potala, is the Chief Pontiff of all the Lamas. The Monastery of Potala, is reckoned by the pilgrims in this quarter to be the most magnificent and splendid place that can be conceived; and the greater part of them have an idea that no building in the whole world can rival it in the multitude of costly edifices and gaudy ornaments.

The next in succession to the Grand Lama of Lahassa, is Punchin-Rimboche, of Teshoo-Loomboo; and the third in order is Lochawa-Rimboche. These three personages are all of the Geloopa sect, and are never supposed to die, but, on the dissolution of the body, the spirit is thought to take possession of another tenement.

The Lochawa resides at Teshoo Loomboo, and for many years past he has appeared in Koonawur. He was born at Soomra of Hungrung, thirty-five or forty years ago; at the age of sixteen or eighteen he went to Teshoo Loomboo, where he died; he afterwards made his appearance at Shealkhur, was sent to Teshoo Loomboo, where he also died; he

then appeared at Nako, and two children had the same marks by which he is said to be recognised; this was something uncommon, and many letters passed between the Busehur people and Punchin Rimboche on the subject, and Lamas were sent from Teshoo Loomboo to ascertain the fact; at last it was decided there were two Lochawas, but one had the precedence of the other. They are now each about ten years of age, and reside in the monastery of Kanum, where they are taught the mysteries of their religion; they have twice been called to Teshoo Loomboo, but the Gelong who has charge of their education, told me they would not repair thither for six or eight years to come.

The Monastery of Kanum, which is inhabited by Geloopas, is the most famous in Koonawur; I did not visit it, but passed within some miles of it, and heard the Lamas at their devotions chanting hymns, accompanied by a powerful band of music.

Captain Turner says, the next person in succession to the Teshoo Lama is the Taranaut Lama; I only saw one Koonawuree who knew his name, and he said the Lochawa had the precedence, very likely from being born in his own country.

VILLAGES.

The villages are neat and some of them large; they are commonly in a number of small detached portions, and Shipke, on the Chinese frontier, is a considerable place; I have got the names of twenty-one of its subdivisions, each of which contains several houses, and there are probably more. The houses are usually of stone, but owing to the scar-

city of wood, which is a necessary material in their construction where stone cannot be cut, they do not look so well as those of the lower parts of Koonawur. They are of two stories, with flat roofs, and white washed: none of the habitations either in this part of Chinese Tartary or Ludak can be much under 11,000 feet, for the bed of the Sutluj below Bekhur, where it was measured, is 10,800. Koongloong, or Keinlung, as it is spelled in Arrowsmith's new map, reckoning the fall of the river fifty-five feet per mile as determined by observation, must be about 16,000 feet, and Daba 15,000.

TEMPLES.

There are many kinds of buildings and temples peculiar to the Lamas; the most common are tumuli, named Mane, consisting of a dyke of different lengths from ten to two hundred feet, two broad, and three or four high; they are constructed of loose stones without cement, and upon their tops are numerous pieces of slate of all shapes and sizes, carved with sentences in the Oochen or sacred character. "Oom mane," &c. is the most frequent inscription, and from some superstitious custom in passing these tumuli, the Tartars invariably leave them on the right hand, and will sooner make a considerable circuit than pass them on the other side. I have seen several so situate, that it was necessary to go round a quarter of a mile or more. There is often a pole or two in the middle, and sometimes a flag attached to it. Captain Turner says, that as the engraving on each side begins at opposite ends, the Bhoteea in passing is careful not

to trace the letters backwards; but this is certainly a mistake, since the writing is from left to right, the same as English, and in leaving the Manes on the right hand it must be always traced backwards.

CHOSTEN OR CHOKTEN,

Is found in the vicinity of every Lama habitation, and on the surrounding heights; it is an enclosure formed of three walls and a roof; it is open in front, and inside are one or more buildings of clay, shaped like urns or pyramids. There are often three in number in one enclosure; they are of different colours, yellow, light blue, and white, and many are very neatly executed, shewing a variety of tints, painted with figures of animals. There are usually five or six in an enclosure, seldom only one, and I have seen ten or twelve. I never observed any particular respect paid to them.

DONKTENS

Are Pyramids in steps, with a kind of urn above; they are much larger than the Chostens, are rarely enclosed, and never covered.

LUBRUNG

Is applied to two kinds of buildings, one is a square pile of stones, six or eight feet high, and one and a half or two in diameter; there is a slate on the top, upon which are two or three pieces of quartz; they are erected in the fields, to propitiate the deities for an abundant harvest. The other sort is a place of worship, of various sizes, and there is one at almost every village: the handsomest I have seen

is two and a half miles N. W. of Soongnum. On each side of the doorway is a neat Chosten, passing which and ascending a stone stair, you enter into a large room that leads to three smaller ones, each having three arched doors, the centre one being largest; the rooms have wooden cupola roofs, which open and shut, and the walls of the largest are painted with deformed figures of men and animals. In the room opposite the door-way, is a hideous and frightful image called Dakpo, which is said to represent Mahadeo in wrath. It is eight or nine feet high, and has four feet, each treading upon a man. The monster has six arms; with the two front ones he embraces a woman, the next hand on the right, holds a sword, and the third a spear; corresponding to these two, on his left side, is one grasping a human skull, out of which he appears to be drinking, and in the other is a large scorpion; round his body is a string of earthen balls, representing skulls: and on the whole he has a most horrid and disgusting appearance.

In the right hand room is a gigantic image, at least twelve feet high, called Shika Thooba, or Mahamoonee, I believe the same as Boodha; his countenance is mild and placid, and before him are several brass cups filled with fruit and water; in the left hand room is a cylinder seven or eight feet high, decorated with silk hangings and scarfs.

At certain times all the Lamas assemble in the large room, where they remain shut up for several days singing and chanting hymns, and religious sentences.

LAGUNG

Is a square flat-roofed house, containing a Temple of Mahadeo, according to the Koonawurees, but it is called Mahamoonee by the Tartars. There are usually flags on posts at each corner, connected all round by a string, on which are sewn numerous small oblong pieces of cloth, alternately red, blue and white, inscribed with sacred sentences, flying in the wind.

LAPCHA.

On the tops of many of the houses are square piles of stones, named Lapcha, adorned with juniper branches, and on the road sides are heaps of stones with poles, rags or flags, inscribed with mystic words; and each passenger adds a piece of quartz, or twig of juniper of the large kind, called Shookpa.

DURCHUT.

At the corners of almost all the Tartar houses is a pole, to which a flag, printed with "Oom mane paee mee oom," is attached, with a tuft of black yaks' hair above; these flags, which are called Durchut, are often eight or ten feet long, and one and a half or two broad; the longest side is fastened to the pole, and they are often covered with mystic sentences, alternately red, black and blue, the character is large, and neatly printed; and to the lower part of these are frequently fixed small cylinders to turn by the wind, acting on horizontal flat staves. The Durchuts and Lapchas are considered efficacious in frightening away ghosts, hobgoblins, and evil spirits, which are universally believed in.

Cylinders, called Mane, are common; they are nothing more than hollow wooden barrels, inside of which are sacred sentences printed on paper or cloth; they are closed up, and are generally a foot long; they are placed on a perpendicular axis in a niche in the wall, and are always turned from the north towards the east.

There is a smaller sort, with a projecting piece of wood below, turned about in the hand; and a string with a piece of stone called Poshil, is fixed at one side, to give it a rotatory motion. These are carried about by the wandering Tartars, called Khampa.

At Soongnum there are three cylinders kept constantly in motion by water, on the same principle as the water mills, and at Nisung several are turned by the wind. These are used for the purposes of devotion, and a person in passing one generally gives it a twirl, repeating "Oom mane paee mee hoong."

The largest and neatest I have seen, is at Soongnum; it is about nine feet in height, and five in diameter, painted with figures and gilded letters. The house in which it is placed is square, has a wooden dome on the top and flags at the corners. Around it is an open verandah supported on posts, where there are about forty small barrels in niches. The inside walls are painted with ill finished figures. The grand cylinder is near the centre of the room, cased in a wooden frame, adorned with curtains and hangings of China silk and satin; it is turned by ropes and a winch below, and requires two people to work it properly. On the right hand

as you enter, is a book case containing three rows of five compartments each, in all fifteen, each of which is filled with separate pieces of paper, bound between two slips of wood, and ornamented with silks. The papers are all of the same size, one and a half or two feet long, and nearly one in breadth. They are neatly inscribed with religious sentences printed in the Oochen character, and I was informed they were brought from Lahassa, and cost 500 rupees.

At stated times, the Lamas assemble to read them, and on grand days there is exhibited an iron stand of five squares, one above the other, tapering to the top, which is illuminated with 180 brass lamps, and made to revolve from north to east, in the same direction as the barrels.

On the left hand are many small brass images from Teshoo Loomboo, very well executed: before them are placed cups of fruit and water, which are replenished daily.

Every morning and evening a lamp burns one and a half or two hours, and the large cylinder is put in motion, the faster the better; it is also frequently whirled about during the day in the presence of a few Lamas, who chaunt hymns, ring bells, and sound cymbals, shells and trumpets. Above the cylinder at one side is a bell, which is struck by a projecting piece of wood, at each turn, and the number of revolutions is sometimes counted and noted in a book. This forms a principal part of the Lama religion, and the oftener "Oom mane paeemee hoong" is repeated, the greater is the sanctity; some of the Lamas scarcely do any thing

else, and they sometimes count the repetitions by the beads of their necklace, and the most devout daily register in a book the number of times they have said it.

This sacred sentence is used on all cases of emergency, and when I crossed Charung Pass during a shower of snow and sleet, one of the guides, who was a Geloopa Lama, was constantly repeating it, and when he or I sunk amongst the snow two feet, he vociferated it as loud as he could. Captain Turner could not find out the meaning of this invocation, and I was not more fortunate, although I made many enquiries.

HOLY PLACES.

There are several sacred places frequented by the Lamas and Koonawurees, such as Hurdwar, Benares, Juggernauth, and Gya, all of which are known here by the same names as Captain Turner gives. Some of the usual pilgrimages hereabouts are Tiloknath in Lahoul of Chumba, on the bank of the Chinab or Chunderbhaga River within the Himalaya. There is a grand temple here, called by the Tartars, Gurja Phakpa.

Munmahez, also in Chumba, which is laid down in Arrowsmith's map, but much too far north, is a sacred pond used for bathing, situate amidst the perpetual snow in the outer chain of the Himalaya; nobody ventures beyond this tank, in consideration of two images, which are pointed out as the monuments of heedless adventurers who passed the prescribed limits, and were turned into pillars of stone.

This, no doubt, is the work of some crafty Brahmin, and is not the only pious fraud of a similar kind.

The most esteemed places of Lama worship are Mansurowur or Mapang, and Kylas or Kangree mountain to the eastward, and Jooalamookhee and Rowalsir on the westward.

It is an obligatory duty on all Lamas to perform the circuit of Mapang and Kangree, and the oftener this is done the better, and some people make a point of going once round both every year. The most religious make the circuit of Mapang seven times, which is considered a sacred number.

Jooalamookhee, which has long been remarkable for a flame that issues from the earth, is situate in the Hill state of Kootoch, commonly, but erroneously, called Kangra, which is only the name of a small district, rendered famous by its numerous temples and the strong fort of Nurgurkoth, which was formerly reckoned impregnable.

The temple of Jooalamookhee is a large and handsome building, on the right bank of the Beah River, several miles from the stream; within it is a reservoir of masonry sunk below the floor, from three sides of which issue forth, through iron pipes, flames not much thicker than the wick of a candle; the chief Jooala, is a little larger, and comes from a corner of the interior of the temple, but I have heard that the flames lately ceased. There are two Melas, or Fairs, one in Spring and the other in Autumn, attended by crowds of pilgrims from all quarters of India. The offerings, which form part of Rajah Sinsar Chund's revenue, are reckoned £25,000 or £30,000 annually.

Rowalsir, or Cho Pudma, in Mundee, about ten miles west of the capital, is a pond, a bow-shot or more across, in which are seven small floating islands, probably of wood, covered with earth; the largest is forty or fifty feet in diameter, projecting in the middle like a hill, and on the top there vegetates a tree and some flowers. It is said these islands traverse without assistance from one side of the lake to the other in the morning, and return in the evening. Sometimes they are all in motion together, but for these last three years only the largest and another have moved about; and the Lamas, who are most expert at repeating their sacred sentences, say they can call them when they choose.

MANSUROWUR,

Called by the Tartars Mapang-Cho, so long the reputed source of the Ganges, is situated in a very bleak place, surrounded by arid gravelly mountains. There is parched grass and furze in the vicinity, but no wood; turf extends to the borders of the lake, and there are neither marshy grounds nor swamps. Its height is still a desideratum; and when Messrs. Moorcroft and Hearsey visited it, the observations they took for the temperature of the air, are too irregular to admit of any accurate deductions.

In estimating the height of Mansurowur, it will be most proper to take the fall of the Sutluj, the same as between Shipke and Bekhur; this is fifty-five feet per mile, and the bed of the river under the latter place is 10,792 feet by barometer. The distance between Bekhur and the western angle of Rawun Rudd is one hundred and fourteen miles, by

the map; and if the same declivity be allowed upwards, and two hundred feet for the difference of level between Rawun Rudd and Mapang, which is probable,* since a communication formerly existed between these two lakes, the extreme height of Mansurowur will be above 17,200 feet; perhaps 17,000 may be thought fully enough, but I do not reckon it by any means too much, as, both according to Captain Hearsey and the accounts of the natives, the Sutluj under Daba is very rapid.† Captain Webb's observation from Neetee Pass, gives the Sutluj, in the vicinity of Daba, almost 15,000 feet above the level of the sea. My estimate of fifty-five feet per mile will give about 14,700 feet for the altitude of the spot observed by Captain Webb; so, the upper part of the course of the Sutluj would appear to have a greater fall than I have reckoned it, and Mansurowur will be still more elevated than I have supposed. Upon the whole, we may conclude that this celebrated lake cannot be less than 17,000 feet from the surface of the sea, upon the most moderate computation.

I may add, that Captain Webb's barometric observations at Neetee Pass, reckoned above Calcutta, give nearly the same altitude as the corresponding ones at Soobathoo, which has been determined by two years' observations, with unexceptionable barometers, to be 4,205 feet.

* The distances from Shipke to Bekhur, and from the latter place to Rawun Rudd, are measured direct on the map, taking Captain Webb's position of Mansurowur, given in the 13th vol. of the Asiatic Researches, as being nearer to the truth than any other assigned to that lake.

† Captain Hearsey estimated the rate of the current eight miles per hour, which is as much as in any part of Koonawur.

I would rather depend upon the altitude calculated above Soobathoo, since the difference of latitude between that place and Neetee is only two or three miles; and it may be concluded that the density of the atmosphere in the same parallel, and in a space of three degrees of longitude, does not undergo so great a variation at the same time of the year, as where the difference of climate and distance is much more considerable, as is the case with Neetee and Calcutta. For those who are curious to re-calculate the height of the pass, I subjoin Captain Webb's observation, and the correspondent one at Soobathoo, at the same hour and the mean of three days:—

	Bar. alt.	Ther.	Det.
Soobathoo . . .	25.735 . . .	76° 1′ . . .	78°
Neetee	16.270 . . .	47°	

By La Place's formula, and Raymond's coefficients, this, together with Captain Webb's depression, will give the bed of the Sutluj fully 15,000 feet above the level of the sea.

The only firewood near Mansurowur is the prickly bush before mentioned; but notwithstanding the extraordinary altitude of this spot, lamas and nuns, who subsist chiefly by the offerings of pilgrims, reside in houses on the bank of the lake throughout the whole year; and this is most likely the highest inhabited land on the face of the whole globe.

The vast elevation of the land in this vicinity is unquestionable, from the circumstance of four of the longest rivers in India taking their rise in that quarter.

1st. The Sutluj already mentioned.

2nd. The Singe Choo, or Singzhing-Khampa, Sind or Indus, has its source to the northward of the Kylas Mountain, and some of its fountains come from the foot of it: this river passes three or four marches to the eastward of Garoo, runs three miles south of the capital of Ludak, and three or four days journey to the northward of the valley of Kashmer; this is reckoned the principal branch of the Indus, and it is joined by the Eekung Choo, which washes Garoo, and is a river of some size, as may be seen by Mr. Moorcroft's narrative. Another great branch, whose name I did not obtain, but it seems to be the Shayook of Lieut. M^c^Cartney, is said to lie to the westward of the road from Leh to Yarkund. In Mr. Elphinstone's Caubul there is some mention of a route from Kashmer to Leh by Meer Izzut Oolla, an intelligent native of Delhi, who did not fall in with the Ludak river until he had proceeded forty coss beyond the town of Durras, although Lieut. M^c^Cartney has fixed that place at the junction of two great branches of the Sind; the southern of which he reckons largest. This does not agree with my information, and all the rivers, or rather rivulets, that join the Indus from the southward, are said to be inconsiderable. The usual name of this river has been mentioned, but it is likewise called Khampa, Choo, and Sanpoo or Sangpo, all of which words in the Tartar language signify river,

3rd. The third river is said to be larger than the Indus, and is called Tamjoo, Damchoo, or Erechumboo; that is, the Brahmapootra. The first word is

recognised in the Tzanga or Tzanciu of Father Georgi, who crossed it on his way to Lahassa, and Captain Turner mentions the last at Teshoo Loomboo. One stream, which is reckoned the principal, rises S. E. of Mansurowur, and there are others from the eastward; this agrees very well with the accounts of the Lamas, who describe the Brahmapootra as issuing from the eastern side of Mount Kentaise, undoubtedly a topographical error for Kenlaise (Kylas), which those people must have well known, since it is the duty of Lamas to perform the circuit of that mountain. They make the Brahmapootra* rise S. E. of Conghe Lake, which the Koonawurees call Koongeoo or Goongeoo; there must, however, be many heads to this river; so I look upon the accounts of the Lamas as pretty correct. Tieffenthaler says the Sanpoo or Brahmapootra, issues from Mansurowur, which accords with the western branch; and I may here add, that the natives, speaking generally, say the sources of the above three rivers and also of the Gogra, are at Mansurowur; by which nothing more is meant than in the vicinity of that place. The direct road from Mapang to Lahassa, situate fifty days journey to the S. E., lies along the bank of the Tamjoo, which is here called Erechumboo, and is said to be almost plain and practicable by horsemen at full speed in most places.

The fourth river is the Gogra or Soorjoo; according to Tieffenthaler, it has been traced into Lanka-

* It is satisfactory that I am able to corroborate the accounts received by Mr. Fraser regarding the Singe-Choo and Brahmapootra: the name of the ridge whence the eastern branch of the latter issues, is called by my informants Mûrgeoolma, which is said to be a prolongation of Kylas.

Dhe Lake, which, from its position being close west of Mansurowur, and the affinity of names, can be no other than Rawun Rudd or Langa. Tieffenthaler, however, did not visit it himself, but stopped a short way within the Kumaoon Mountains, and took the account of the upper part of its course from a native.

The Gogra has its source in the district of Poorung, of which Tuglakoth or Tuglakhur is the chief place, situate about a stage and a half to the S. W. of Mansurowur. Poorung lies within the Himalaya, and is bounded on the north by a lofty range of mountains, which separates it from Mapang. The word Gogra* or Ghagra, is very seldom used in the hills, and I believe it applies properly to the stream that rises near Biddeanath, noticed by Captain Raper in the Asiatic Researches.

The western great branch is called Kalee, after it leaves the Himalaya; and the eastern one, which is much the largest, Kourealee or Kurnalee; the latter flows through Joomla, and unites with the former in the Khyregurh district.

Major Rennell thinks the Manchoo of Du Halde is the Aluknundra, but from the similarity of names it must be the Manja.

I likewise heard vague accounts of a fifth large river, said to run N. E., which is crossed twelve days East or E. N. E. of Garoo. If this be the case, which is probable, it may be Yangtse-keang of China, which is laid down in the maps as rising in

* After the conflux of the Gogra at Puchesur, the latter word is sometimes used; but at Brihmdeo, where the river penetrates the mountains, I never heard any other name than Sarda.

the sandy desert, 200 miles to the N. E. of Mansurowur, but it much more likely comes from the snow, the melting of which in the hot weather must produce a great quantity of water: so the length of this river, if it come from near Mansurowur, will be very little less than that of the celebrated Amazons, the longest river in the world.

Mansurowur is reckoned four days * journey, or fifty miles in circumference, and the road is good; the lake abounds with fish, which are considered sacred and are not eaten, although those of Rawun Rudd are; the waves are represented as being very high at times, breaking with great violence, and throwing fish ashore: many kinds of wild fowl frequent this elevated spot in summer, but in winter

* In Mr. Fraser's book, Mansurowur is estimated six or eight days journey in circumference by Putee Ram, but as he is not a Lama, he probably never performed the circuit, and I would rather depend upon the accounts I received from the Lamas. I mentioned before, that Putee Ram's bearings were not at all to be depended upon; Mr. Fraser, however, thinks that they are more accurate than Captain Hearsey's, (although that gentleman had a pocket compass); and he concludes that Captain Hearsey's position of Mansurowur is too far to the south; I do not agree with him, for Captain Webb says he found the Pundit's measurement almost coincide with his own as far as Netee Pass, and he thinks there is a less chance of error beyond that place, because the country is comparatively plain.

Moreover, Captain Webb, who was within fourteen or sixteen miles of the lake, assigns even a lower latitude, but they both agree very exactly in the longitude. As the latter officer was furnished with good instruments for observing latitudes and azimuths, (whilst Captain Hearsey had none,) Captain Webb's position certainly deserves the preference; since he could not err much either in direction or distance in so short a space.

By some unaccountable mistake, the Pundit has been said to stride the whole way at paces of four feet each, which is quite impossible even on level ground. Captain Hearsey explained this to me: at first he said that he reckoned the pace four feet, but on enquiry I found he meant the Hindoostanee Kudum or Qudum, by Dr. Gilchrist, which is a double pace. This estimate of four feet to the Qudum, agrees very nicely with the distances I have measured in mountainous countries. I have employed several natives to pace distances, and they invariably computed by the double pace.

they migrate to Hindoostan. This lake freezes round the edges in October, but owing to the impetuous force of the wind it is rarely all frozen until the end of November. In December, January and February it is quite hard, and cattle cross; the ice breaks up in March, and floating masses appear in May.

It is lowest in the cold season, as then no streams flow into it, and it is at its greatest height in June and July, from the melting of the snow; little snow falls here, and a foot deep is not common; it is all of a powdery sort, and the wind whirls it about and disperses it. The winter is very stormy and incredibly severe, and the hottest months are June, July and August, during which time water freezes every night.

Mr. Moorcroft could discover no outlet of this lake,* although he heard that a communication formerly existed between Mapang and Lanka; my information is positive, that about twenty years ago, a stream, which was rapid, and crossed by bridges, ran from it into Rawun Rudd, but it has since dried up, and the Lamas who reside on the banks, have an idea that a subterranean communi-

* Mansurowur has always been reckoned by the Hindoos to be the source of the Sutluj, although European geographers were of a different opinion. Captain Webb thinks that there is a considerable difference of level between the two lakes, and that the superfluous water of Mansurowur is drained off by a subterraneous passage, and I fancy he is right.

Mr. Moorcroft says, that the Pundit and Latakee insisted most positively, that they crossed the outlet of Mansurowur by Sangos, eight and sixteen years before Mr. Moorcroft visited it; and they also said that they could bring forward the evidence of all the inhabitants in the neighbourhood in support of their assertion. I *do not* see the slightest reason to disbelieve them, but I think Mr. Moorcroft might have sent for some of the inhabitants to ascertain the fact, and set the matter at rest.

cation exists. The Chinese Governor told Captain Webb that 100 streams fell into Mapang, and one, which was most commonly dry, flowed from it into Rawun Rudd. Mr. Colebrooke justly concludes that the evaporation in so cold a climate cannot be equivalent to the influx of water in the season of thaw, and at the time this was written, he was probably unaware of the vast altitude of this spot. The water of this lake is said by Mr. Moorcroft and all my informants, to be quite fresh and well tasted, while according to the Quarterly Reviewers, every lake without an outlet must be salt; so there is probably some drain for the waters of Mapang, either above or under ground; for, from its being surrounded by stupendous mountains, it must receive nearly as many rivulets as Rawun Rudd, and the stream that issues from this last lake is very considerable in the hot weather; besides, one of the rivers that run into Mansurowur, is stated to be of some size. This the people call the Sutluj, the most remote source of which is said to be at a place named Chomik Tingdol, where a small stream gushes rapidly out of the ground with a rumbling noise: the length of this river is reckoned about forty miles, and it passes through, or rather by expanding, forms Goongeoo Lake, the Conghe of the Lamas. Goongeoo is called fifteen or twenty miles long by the course of the river, but very narrow.

Without supposing an outlet, it is difficult to account for the rise and fall of the Lake, which are mentioned by every one.

KANGREE, KYLAS OR HEOONLAS,*

Is said to shoot up from the plain with an immense inclination, to an extraordinary height; its top is always white with snow, but notwithstanding the wonderful appearance of this mountain, Mr. Moorcroft, as far as I remember, says little about it, which, according to my information, ought to have been particularly mentioned. Captain Hearsey, however, in a sketch which I saw, has represented it as ending in a very acute point, and being far elevated above the other mountains; the circuit of Kylas is generally performed in one stage and a half, it is completed in one day on horseback, but the peculiar sanctity consists in walking round both it and Mapang. In the longest days, should a traveller keep himself in motion, it can be performed from daybreak till dusk, which is reckoned a great feat. Several of the Lamas and Khampas make the circuit of this mountain, as well as of Mapang, every year, and I have seen numbers of them.

There is a mountain of the same name near Reedung, which has an elevation of 30° to 32°. It rises to the height of 12,000 feet above the town, or 21,000 higher than the sea; and to shew the idea the natives have of the Eastern Kylas, I need only mention that the Reedung Kylas, is not reckoned half of the other, and is said to be a piece

* Dumchoo by Putee Ram, in Mr. Fraser's book, like most Tartar places, has several names. It is also called Durchun, and is situate at the foot of Kylas, Kengree or Gangree, which last two words are also sometimes applied to the place, although they properly belong to the mountain itself.

Heoonlas and Kangree are the Tartar names for this mountain; Kylas the Hindee one.

of it, broken off and removed by the gods to please a devotee; they also say that the Eastern Kylas is much steeper than the Reedung one.

This estimate is very vague, for if both the mountains called Kylas be taken at the same height from the ground, the eastern one will come out 30,000 feet. At all events, however, it must be very elevated, considering the vast height of the plain from which it rises.

HOT SPRINGS AND SUBTERRANEAN FIRES.

There are no volcanoes in any part of those hills, and, I believe, it has been remarked that they have seldom been observed at remote distances from the sea, and some people think that the elastic force of the steam of water is necessary to produce these dreadful irruptions.* There is certainly no want of the ingredients to form volcanoes, as is instanced in the numerous hot springs and subterranean fires, and, probably, the same cause that prevents volcanoes, may render the earthquakes, which are felt in Upper India, slight: one, however, occurred in 1803, which shook most of the edifices in the northern provinces of Hindoostan, and laid great part of Delhi, Agra, Sirinugur, and other places, in ruins.

Subterranean fires have been observed in several

* This hypothesis seems to be overturned by the existence of two volcanoes in Central Tartary, 1,200 miles from the Caspian, which is the nearest sea.

They are the volcano of Tourfan, in lat. 43° 30′ and long. 89° 31′, and the White Mountain in the country of Bisch Balikh, in lat. 46° and long. 78° 30′ (See Edinburgh Philosophical Journal, vol. iv. page 156.)

places; one of these, Jooalamookhee, in the district of Kangra, has been mentioned; another was visited by Mr. Forster at Muschid-Sir, on the bank of the Caspian; and I have heard of three in the hill state of Dooloo, to the eastward of the Gogra; these are at Padooka, Nabhee, and Siree-Than, within a distance of fifteen or twenty miles.

Hot springs are numerous: those at Budreenath, Tirtapooree, Jumoutree, Koongloong, Rungpoor, and near Teshoo-Loomboo, have been visited by other travellers. There are some in the Rajship of Sooked, opposite Soonee, on the right bank of the Sutluj; there are eight or ten of them, which, of course, are reckoned sacred. They are about 2,000 feet above the level of the sea, and two or three feet distant from the stream. On the 11th October, the thermometer plunged into one was raised to 130° 5′, whilst the temperature of the river was 61°. As the Sutluj rises, the springs recede, and keep nearly the same distance from it; the water bubbles up amongst small pebbles, has a strong sulphureous smell and very disagreeable saltish taste, and encrusts the stones with a yellow substance, perhaps sulphur.

In Kooloo, on the right bank of the Sutluj, there are hot wells at Kulat, Bushist-Rikhee and Mŭneekurn; the last is most celebrated, and the water is said to be so hot as to cook rice.

In Busehur there are hot springs, at Jouree, Nutpa, and Boktee; but by far the most famous in this quarter is Zungsum, between the Speetee and Paratee rivers, four miles north of Shealkhur: I wished to visit it in August last, but from there being

no bridge, it was impossible to cross the river when swelled by liquid snow. These wells are in the greatest repute, and diseased people travel from distant places to bathe in them and drink the water, which is said to excite a great appetite. There are six or eight springs not far from the river, each of which is reckoned a specific against some complaint, and the names of the different diseases, together with directions for bathing and drinking the water, are engraved in the Tartar language upon large flat stones fixed by the side of each.

RAWUN RUDD, OR, LANGA-CHO.*

Mr. Moorcroft says this lake is reckoned four times as large as Mapang, which would give the circumference about double, but most of the accounts I have received, make it no more than six days circuit, and only one person called it seven. The circuit of Langa is not strictly enjoined by the Lama religion, and I have not seen more than six or eight people who performed it. The road is represented to be much worse than the one round Mansurowur, and full of angles and sharp turns, so it is likely not much larger than Mapang. Mr. Moorcroft states, that Rawun Rudd has always been represented to him as surrounding some large portions of rock a little detached from the Himachul, but adds, "this being the report of natives, must be received with caution."† Now, I do not subscribe

* This lake, as well as Mansurowur, abounds with water-fowl in summer such as geese, ducks, saruses, cranes, and gulls of various kinds.

† If a person take the least trouble, he can soon see if the natives are telling the truth or not: as good a way as any is to note down a route as it

to this, for by multiplying enquiries a person must certainly arrive at the truth; and I think it still more extraordinary that Mr. Moorcroft should disbelieve the existence of an island, for he had a good opportunity of settling this point, since he encamped once or twice within five or six miles of the lake. I have received accounts from at least fifteen people, that there is an island, or rather small hill, in Rawun Rudd, and it would be folly to doubt it, since the information was obtained at various times from inhabitants of different places. A few Lamas reside on the island, which is 200 or 250 yards in diameter; there are not any boats or rafts on the lake, and the Lamas have no communication with any person except in winter, when the water is frozen.

GAROO, GARTOP, GUR, YOOGAR, ZHOOGAR, OR GURTOKH,

For it is known by all these names. Is a collection of black tents inhabited by pastoral tribes for six months. In winter, the Tartars retire chiefly to Eegoong on the bank of the river, two stages down the stream, and the Chinese governors reside at the Fort of Tuzheegung, where they have houses. Garoo is the most famous mart for wool in Chinese Tartary, and there is a fair of 10,000 or 12,000 people in July, well attended by merchants from

is given, then to call the informant a day or two afterwards, and make him repeat it again, (even an hour or two afterwards will often answer). If there is more than one person, they should be interrogated separately. It is also a good plan to give them a sheet of paper, and let them put down the villages; a few known distances should also be asked, in order to get some idea of the scale. Their direction of roads, however, can never be depended upon.

Kumaoon, Koonawur, and Ludak, and sometimes from Yarkund. Wool, borax, and salt are the principal exports, and these articles are exchanged for the produce of the plains of India.

The country about Garoo must be very elevated, since the only productions are prickly bushes, and small tufts of short brown grass.

Garoo, although only an encampment, is reckoned the chief place in Gnaree, which district is entirely dependent on Lahassa.* There is a regular intercourse between those places, and the Garpans, or governors, who are relieved regularly, are generally inhabitants of Lahassa.†

THOOLING OR LING.

On the left bank of the Sutluj is a large place inhabited by Geloopa Lamas. It contains a grand temple called Shikja-Thooba or Mahamoonee, with a gilt cupola roof, much resorted to by pilgrims from all quarters.

Under this place the Sutluj is said to be very broad, and there is a Chukhzum or chain-bridge over it. The people reside in houses, and in No-

* Lahassa, in Mr. Fraser's book, is reckoned ten months' journey from Mansurowur; but this is evidently a mistake, for all the people I have seen call it only fifty stages, and I understand that the distance has been performed by horsemen in thirty-five days.

† The Chinese Tartars have officers of various designations:—

1. Umba, superior to the rest: there are several at Yarkund and Lahassa.
2. Garpun, military commander, of whom there are two at Garoo.
3. Deba, governor of a town.
4. Zongpoon, governor of a fort.

The above four officers are regularly relieved. I understand that the Umbas are nominated by the Emperor of China; and the others, who are generally inhabitants of Lahassa, by the Grand Lama.

5. Ponpon, in charge of a district.
6. Lafa, chief of one or more villages.

vember there is a fair, attended chiefly by merchants from Kumaoon, who bring articles for sale. The concourse of people is stated at 1,500, beside many Lamas.

CHUBRUNG,

Situated three miles S.W. of Thooling, is a collection of tents, inhabited during the winter. There is a fort here, where a Zongpoon or governor resides; and the communication from Busehur to Chubrung continues uninterrupted throughout the whole year; and people proceeding between these places in the cold season, travel upon the Sutluj, which is entirely frozen for two months at least. They take a bag of earth with them, and keep sprinkling it upon the ice, which is generally slippery, until finished, and replenish it at a convenient place.

Chubrung and Daba are inhabited by people called Marchas, as mentioned by Mr. Moorcroft; but whether they be different from the Tartars, or not, I could not ascertain.

ROODOK

Is a town of two hundred houses, on the right bank of the Indus, half way between Leh and Garoo. This place is famed for the many salt and borax lakes in its vicinity. These two minerals are sometimes found in the same lake, the borax being near the edges, and the salt in the deeper parts; but they are more commonly in different lakes. The principal here yielding salt, are Gok-Dangcham, Zhangchaka, Meendoom Chaka, and Chakchaka; the one producing borax is called Challechaka. Salt

and borax are likewise found near Mapang, but not in any quantity. Borax is produced at several places in Ludak and Lahoul of Kooloo; and there are sulphur mines at Kolok, Dimzhog, and Neooma.

SPEETEE

Is a district lying between Busehur, Kooloo, Ludak, and Chinese Tartary; to each of which states it is tributary. It comprises about thirty villages, few of them under 12,000 feet; and the fort of Dankur, in lat. 32° 5′ 30″, situated amongst rugged projections of gravel, is the chief place, and contains about forty houses. The walls are partly stone, partly mud; there is water inside, and the site is well chosen. Its height is 13,000 feet, and the villages farther up the river are probably still more elevated. A Garpun or Governor stays here on the part of the Ludak prince or Geapo; but his authority is little more than nominal, and he receives the tribute. There are three divisions of Speetee, Manes, Peenoo, and Losur; each under charge of an officer called Lafa. Money is chiefly paid to Ludak; but to the Chinese and Kooloo the tribute is either blankets or wool; and to the Busehur government, the annual tribute is thirty blankets (Punkhee).

This district has occasionally been under the authority of each of the above states; and about fifty-five years ago, the fort of Dankur was possessed by the Busehurees, who kept it for two years. Speetee has frequently been the scene of war; but their contests were never bloody, and resembled the frays of the Scottish clans of old, being

confined to the seizure of cattle, and sometimes setting fire to a village.

There are are two principal valleys, Speetee and Peenoo, which are both of the same character; the first runs N. W. and S. E., and the last N. E. and S. W.; they are limited by cliffs of marled and blue limestone, and the N. E. and N. W. faces are steepest. The glens are similar; of loam, clay, gravel, and pebbles, seeming as having been under water.

The dell of Speetee is broadest, and both have an uninviting and inhospitable aspect, and in some places there is scarcely a bush or even a tuft of grass; and about Losur, farther up the river, the country must be still more sterile.

The lower half of the houses here, and I have heard, throughout most part of Ludak, is built of stone, and the upper of unburnt bricks: they are two stories high, and flat roofed. The country, as far as I saw, had a very desolate appearance. There are some dwarf poplars near Manes, but nothing in the shape of a tree about Peenoo, thirteen miles farther up the river, and the few prickly bushes there, are not above three inches in height. The labour of collecting firewood is great; they have often to go a long distance for it, and they bring it to the villages on yaks, and pile it upon the tops of the houses.

The only grains I noticed were wheat, ooa, barley, phapur, peas, and some turnips, and the crops, which did not reach above 12,500 feet, were few, but seemed in pretty good condition.

In Speetee the Tartars are generally dressed in black blanket; their upper garment resembles our

great coats, and looks very well; they wear stockings and boots like those of Shipke; the woollen part of the latter is always of two colours, black and white, red and yellow, tartan and red, &c. I have seen two kinds of head-dresses in this district. At Manes, they commonly wear hats in shape like ours, of yellow cloth, with a narrow rim, fringed with red worsted projecting from near the crown and hanging down on the sides two inches; this head-dress is extremely neat. At Peenoo, again, they have black caps not unlike the Highland bonnet.

The inhabitants of Speetee trade with their neighbours on the other side of the Himalaya; the exports are wool, borax, salt, and blankets; and the imports are articles from the plains, and a great deal of iron.

There are lead mines at Lara, Leedang, Pokso, and some other places; they are very productive, but the lead is reckoned inferior to that of Sirmoor and Jounsar: it sells at two or two-and-a-half pounds per rupee.

The people, who are Tartars, are robust and good-looking, and have more frankness and openness than any I have seen. They smoke continually, eat almost nothing but animal food, and drink a great deal of tea, and spirits made from grain called Chong. They herd vast droves of sheep, goats, horses, and yaks, all of which are killed and eaten.* They are a joyful set of people, and during

* When I first began to travel upon the elevated land, where villages do not occur for many days, I was often put to much inconvenience from want of supplies, and it frequently happened that when a sufficient quantity of grain was collected, the scanty population could not furnish porters for the conveyance of half of it; I was, therefore, sometimes under the necessity of

most of the eight days I staid in Speetee, I observed them running horse races, and singing, dancing, and playing upon musical instruments. They came in crowds to see me, and I was highly pleased with their behaviour; they did not shew the least reserve, and talked freely upon all subjects. Since my arrival amongst the Tartars, I had paid some attention to their language, and had collected about 1,500 words and sentences; and, by the time I reached Speetee, I was able to carry on some kind of conversation. I had also the advantage of an interpreter, a Lama from Teshoo Loomboo, who had frequently visited Hurdwar, and could talk Hindoostanee very well. I saw this person formerly, and I made him a present of some money: he recollected me instantly, and was very grateful for the notice I took of him at Soobathoo, which he endeavoured to repay by many friendly offices. The two sacred colours amongst the Lamas are red and yellow, and the people here did not well know what to make of me, as I wore a red coat with yellow facings: they often enquired if I was a Lama, and which sect I belonged to. They asked many questions about the inhabitants of my native country, and seemed greatly delighted when I told them

leaving several very useful articles behind. Before my journey to Speetee, I mentioned this circumstance to Putee Ram, (so often alluded to,) as my return from Speetee was very uncertain, owing to the threatening aspect of the weather, and several other circumstances. Putee Ram replied with his usual frankness, "This is my business;" and he left me. I did not understand him, but, to my surprise, he soon afterwards returned with a large flock of sheep, and said, "I'll make you a real Tartar: you have grain for ten or twelve days, and now you have no use for porters; load the sheep with the grain, finish it first, and then kill and eat the sheep: this is the way we travel on the uninhabitable tracts; we never think of grain as long as we have plenty of sheep." So I, of course, adopted his advice.

there were monks and nuns in Europe. I mentioned I was of a different religion, but the Lama of Teshoo Loomboo made out another story, and, as I had shewn him their favorite sentence, "Oom mane paee mee oom," in Captain Turner's Thibet, he persuaded the people that our religion scarcely differed from theirs, as he had seen our sacred books. A number of respectable persons visited me there, and brought sheep, goats, and blankets; I was troubled with their attention, but without offending them could not refuse their presents, for which I always made a suitable return. I saw more of the Tartar character in Speetee than any where else, and in my intercourse with them, silk scarfs, called Khuttuk, were exchanged with most people; the prevalence of this custom at Teshoo Loomboo and in China is remarked by Captain Turner, and it takes place in Ludak and Yarkund.

The fields and gardens here are enclosed by hedges of gooseberries, prickly bushes or stone dykes; the cultivation is not sufficient for the support of the inhabitants, but even part of this is made into liquor and part exported.

The wool of Speetee is remarkably fine, and the blankets made of it are warm and substantial; it is not so long as that of Chinese Tartary, but it is fully as soft. The under fleece of the goats is the shawl wool, but there is less in quantity than on the higher lands to the eastward.

LUDAK*

Runs along the banks of the Indus, and is bounded on the North by Yarkund and its dependencies; on the East and South-east by Chinese Tartary; on the South by the district of Speetee; on the South-west it comes in contact with Lahoul; and on the West it borders upon part of Chumba and Kashmer. It contains many divisions; one of which, Chooshat, a fertile and populous place near the capital, is almost wholly inhabited by Mahommedans, called Byltæ, who have been settled there many years.

The face of the country, with the exception of the banks of the Indus, is very similar to that of Chinese Tartary, presenting arid plains and gently sloping hills: the climate is likewise much the same.

* Ladack, or Latac in the maps. In a late number, the Quarterly Reviewers complain, and not without reason, of the great want of uniformity is spelling Indian words. It has generally been customary for every body to adopt an orthography of his own; and many of the names of places and persons, written by different people, cannot be recognized as the same; thus, Giafar and Jaffier, and numerous instances in Turner's Thibet.

There are two systematic modes of spelling, Sir William Jones's and Dr. Gilchrist's; but even they are so dissimilar, that one cannot always discover the same words when spelt in the two different ways.

Dr. Gilchrist's method is, I believe, allowed to be the best; and a person unacquainted with either is certainly more likely to sound it, in most instances, nearer the true pronunciation than Sir William Jones's: thus, Kunk,hul seems better than Canc,hal, and Oondes than Undes, and they are not so apt to be printed improperly, for, if the (,) be omitted in the last word, the sound is entirely changed. I have adopted Dr. Gilchrist's plan, which I first learned on my arrival in India, and I mention this, that I may not be accused of inconsistency, having lately seen an extract from a paper on the Geology of the Valley of the Sutluj, (wherein my name is mentioned) prepared by Mr. H. T. Colebrooke. In the manuscript I wrote the names according to Dr. Gilchrist's method, but Mr. Colebrooke changed them to Sir William Jones's, which he has uniformly adopted in all his writings.

Streams are rare and scantily supplied, and many places, especially Roogshoo or Roopshoo, a district near the head of the Para river, are far too elevated for culture, and are inhabited only in summer by pastoral people, who dwell in tents. The inhabitants of Ludak are similar in their manners and religion to those to the eastward.

The Chief or Rajah, who is named Tondook Numgeal, is styled Geapo or Gealbo; he is almost independent, but every three years he sends some presents, consisting of a few shawls, yaks' tails, and musk bags, to Lahassa; the same to Kashmer, and, I believe, likewise to Yarkund; this can scarcely be called tribute, for the Busehur Government, who are under the protection of the British, also send a few trifling presents every three years to Garoo, for the Grand Lama of Lahassa; so this custom may only be acknowledging that personage the head of the Lama religion. Runjeet Sing's ambassador from Kashmer visited Leh in 1819, but he returned after exchanging presents with the Gealbo, and I have not heard of his being there since.

Such a country can present but little temptation to Runjeet, whilst Afghanistan offers so much more scope for his ambition; he would not find it easy to take an army into Ludak, on account of the difficulty of subsisting it, and all he could get would be at and near the capital, for the people, who are mostly shepherds, would soon remove out of his reach, and it would be unprofitable, if not impossible, to pursue them.

The capital, Leh, is situate on the right bank of

the Indus* two or three miles from the stream, and contains nearly 1,000 houses, built like those in Speetee. There are some Mahommedan and Hindoo shop-keepers, but the greater part of the inhabitants are Tartars. The productions of the ground are wheat, barley, ooa and phapur, peas and turnips, Flesh of all kinds forms the principal part of the food.† There are poplars, apples, and apricots on the bank of the Indus, the latter are not common. so the altitude of Leh may be inferred from the trees to be about 10,500 or 11,000 feet above the sea.

There are several fairs attended by Punjabees, Yarkundees, Koonawurees, and Kashmerians. The dress of the inhabitants, as far as I have seen, is similar to that worn in Speetee, and the religion is Lama.

YARKUND

Is stated to be forty days journey N. N. W. of Leh, half of which lies through a desert country; notwithstanding the elevation of which, some parts are so full of swamps, as scarcely to be practicable by horsemen, until the frost sets in. Yarkund is described as being a large and magnificent city, containing many splendid and lofty buildings; it is under the Chinese, and the inhabitants are Moguls, and speak the Turkish language. It is said that Russian merchants often visit Yarkund.

* A rivulet runs past the town, and the land slopes gently to the river.

† Grain is very scarce, and a small quantity is imported from Koonawur of Busehur and the lower hills.

GOLD.

All the rivers abound in gold dust, and this precious metal is sometimes found in large pieces. There is a gold mine at Dango Bookpa, twelve days journey S. E. of Mansurowur, and very lately they say one has been discovered between Goongeoo and Mansurowur, which was immediately shut up by orders from Lahassa.

The people told me, that after the sand of the river is washed so as to be free from all the lighter particles, it is mixed with quicksilver, and the gold is detected by observing the pieces tinged by that metal, which is afterwards evaporated by heat.

LANGUAGE.*

The language abounds with z, zh, pa, ba, and kh, and is distinct from the tongues spoken in lower Koonawur: it prevails from Lahassa all over Ludak, and as far as the confines of Yarkund, where it becomes mixed with the Toorkee or Turkish, which

* The difference of language mentioned by Mr. Fraser, at Sooran, does not seem to me to exist any farther than in a few of the tenses of the verbs and cases of the nouns. I should mention, that on the Gorkha invasion, the Rajah, who was an infant, fled to Koonawur with his mother, and resided there until the British rule was established. Mr. Fraser saw him at Sooran immediately after his return, at which time he could scarcely talk a word of Hindoostanee. He has generally 100 attendants, and at this time he had most probably many more. It is very likely that when Mr. Fraser saw him, all his attendants were inhabitants of Koonawur, for even at this day he has an aversion to the people of the lower hills, and at least nine-tenths of his servants are Koonawurees; this I suppose misled Mr. Fraser, and made him think there was a difference in the language. Sooran itself is a poor place, containing only twelve houses, so Mr. Fraser could have seen but few of the permanent inhabitants in comparison to the number of Koonawurees. As the Rajah's attendants move with the Court to Rampoor in winter, they have no houses at Sooran, and these are the people Mr. Fraser mentions as living in caves. At Rampoor most of them rent rooms from the Bunceans.

is spoken in that country. To the westward of Ludak, it is corrupted with Persian, Pooshtoo, Hindee and Kashmerian. It is very easy to learn in comparison to the dialects of Koonawur, where there is some slight difference in almost every village, which is perplexing to a person who wishes to acquire the language.

There are two sorts of character used, the Oochen for their religious books and sacred sentences, and the Oome for letters; they are both neat, and the latter is very much so. I received many letters during my last visit to Koonawur, and amongst others one from the Garpun of Garoo. The writing is from left to right, and a silk or rather satin scarf, called Khuttuk, is always sent with each letter enclosed within the cover. I have seen two kinds, one white and the other light green. They are described by Captain Turner. The letter is sometimes accompanied by a hieroglyphic painting, representing the subject, like the pictures of the ancient Mexicans. Above this is the Imperial Dragon of China, with extended wings touching the sun and moon, and below is the explanation in writing.

There is a regular horse post between Garoo and Lahassa, and they are so particular, that dispatches are sometimes sealed on the back of the rider, who is sealed to his horse; and whatever inconvenience the postman may be put to on the road, he is not permitted to dismount until he reach the end of the stage, where there is an officer to inspect the seal, to see that it is unbroken. The chief people, such as the Garpun and other officers, are always ad-

dressed Rimboche, which is one of the titles of the Grand Lama.

As remarked by Captain Turner, it is said that the art of printing has been known to the Chinese Tartars from time immemorial, but it is confined entirely to religion. There are, properly speaking, two principal religious characters, the Lungza and Oochen, the former being seldom used; moveable types are not employed, but the sentence, and frequently the whole page, is engraved on wood, and then the impression is taken off. Some of the books are very neatly printed, and gaudily ornamented with China silk. The religious character is generally large, but the other is smaller.

CONGELATION AND SNOWS.

The line of perpetual congelation, according to Professor Playfair, is where it always freezes, or where it freezes more than it thaws, so that the mean temperature is below 32°; but Mr. Playfair's formula, given in his outlines of natural philosophy, answers to the last definition. Others, again, call it the point where it freezes every night in the year; this latter limit, in latitudes 31° and 32°, is somewhat above 15,000 feet. In the middle of June, the sunrise temperature at Shatool, 15,550 feet high, was from 24° to 26°, and at Boorendo, nearly 15,200 feet, at the same time, from 26° to 30°; but in the end of that month, which is the hottest time in the year, where there are periodical rains, it would be about 32°, or perhaps rather more. Now, if we compare this with the least altitude of the thermometer at Zeenchin, 16,200 feet above the

sea, in July, which is the hottest month within the Himalaya mountains where there are no periodical rains, the result will be nearly the same. During the two days I stopped at Zeenchin, the thermometer at sunrise was 27° and 30° .5, and if 260 feet be allowed to a degree for the decrement of caloric, the point where it freezes every night will be 15,300 feet; this, however, is very different from the place whose mean annual temperature is 32°. From observations taken in October, which month gives almost exactly the mean of the year in these latitudes, the medium temperature of Boorendo Pass appears to be 27°, and this agrees very well with what it should be by Professor Leslie's formula, reckoned from Soobathoo 4,200 feet above the sea, where the annual temperature, from many years' accurate observations, has been found to be 64° 5. Professor Leslie's formula will give Boorendo between 26° and 27°; so, if the last be taken as the temperature of 15,000 feet, the altitude where it is 32°, in lat. 31° 30′, will be about 13,700 feet.

The inferior limit of perpetual snows, does not appear to follow the same regularity on the Himalaya mountains, as on the Andes, and mountains in Europe, there being a very great difference between the outer and inner ranges. It had long been supposed, that the annual temperature of this curve was 32° in every latitude, but Baron De Humboldt has ascertained that it decreases from the equator towards the poles. At the equator it is 34° .7, and in the temperate zone 25° .3; so, in lat. 31° 30′ it will be about 28°, which is equal to almost 14,700 feet of elevation, judging from the observations at

Boorendo. Although this is considerably higher than theory or observations in other parts of the world give, yet it is not the inferior limit of perpetual snows, which in the intra-Himalayan regions depends upon a variety of causes, such as locality, the quantity of snow that falls in winter, and the reverberation of the sun's rays from a large extent of elevated land, such as is found within the Himalaya, in Chinese Tartary, and Tibet. I have measured a snow bed at 10,700 feet, which had resisted the influence of the whole summer's sun, but most of this had descended from the rugged mountains above. The limit of perpetual snows is lowest on the outer Himalaya, and here the continuous snow beds exposed to the south are about 15,000 feet. It should be observed, however, that a great deal of snow falls there; whilst in the interior, where the sun shines bright throughout the rainy season, no perpetual snow occurs at much greater altitudes. In ascending Keoobrung Pass, 18,313 feet high, in July, no snow was found on the road. In August, when I crossed Manerung Pass, 18,612 feet, there was only about a foot of snow which was new, and had fallen a few days before; and the snow beds that occurred on the road to the pass, must have been the accumulation of ages, having been precipitated from the surrounding cliffs. This, although perpetual, cannot be called the inferior limit, otherwise the snow-bed at 10,700 feet might with equal reason, for had the road to Manerung been upon the face of a range, and not in a deep glen, there would have been no snow. In October, on the ridge above Nako, we ascended to 19,411

feet, and the snow, which was all new, and no more than a few inches deep, was only met with in the last 400 or 500 feet; this was on the face of the range exposed to the west, but upon the opposite side, no snow was seen at almost 20,000 feet. Purgeool, by my measurement 22,488 feet, was quite white in August, but in October it had a very different appearance, and one face of it was entirely devoid of snow; no doubt, part of this had tumbled down, but it was evident, from the form of the mountain, that it could not have been the case with the whole. The snow, therefore, melts at this elevation, and perhaps still higher. In fact, there can scarcely be any limit accurately settled; for there are some very mild and clear winters, during which it is possible that not half a foot of snow falls in Ludak, and the sun's rays on the loftiest peaks that we have visited, are very powerful in August and September.

In latitude 31° snow falls every year at 6,000 feet, at Soobathoo in the same latitude, and 4,200 feet high, it is seen once in two or three years, but it melts almost immediately; it sometimes falls at Nahun, 3,200 feet, and it has even been observed so low as the Dehra Doon, no more than 2,300 feet from the level of the sea, and in latitude 30° 20′.

REMARKS UPON BAROMETRIC HEIGHTS.

Most of the few heights mentioned in the above account of Koonawur, were observed by barometer, and calculated according to La Place's formula, and Raymond's Coefficients, from cotemporary observations taken at Soobathoo and Kotgurh, the altitudes

of both of which places were correctly ascertained, the former by the mean height of the mercury for four years.

As every thing depends upon the accuracy of the instruments employed, I shall observe, that the barometers used by my brother and myself in 1818, which were the first successfully carried through this quarter of the hills, were manufactured by a native of India, and every precaution was taken to ensure precision. The mercury was revived from Cinnabar with iron filings, in an iron retort, and boiled in the tube, which from the thinness of the glass, we found a most tedious and laborious operation, occupying from ten to twelve hours each tube, and although we succeeded in boiling fourteen, yet we broke nearly as many; these tubes were of various lengths, from twenty-three to thirty-one inches: they were compared together, and found to agree as nearly as can be expected, there not being a difference of more than $\frac{1}{100}$ of an inch, which is what the scale read off to; they were immersed in a basin of mercury, and placed perpendicular by a plummet; and the best proof of the air being completely expelled, is that tubes of half an inch and eight inches vacuum, shewed exactly the same height, and on applying a lighted candle to the top of the shortest, the mercury seemed to rise: whereas had there been the least air, it must have sunk by the expansion, which would have been clearly perceptible in so small a space. The scales were fir rods graduated by myself to $\frac{1}{100}$ of an inch from a Trough-

ton's standard brass scale, and they were fitted exactly to the surface of the mercury.

Two barometers were left at Soobathoo, and out of the fourteen which we took with us, only two returned in safety, and these agreed exactly with the others.

The barometer which I used in 1821 was constructed by Dollond, and was of the most improved kind, like those mentioned by Troughton in Dr. Brewster's Encyclopedia. It had a vernier divided to $\frac{1}{1000}$ part of an inch, a glass cistern and screw to adjust the mercury to zero of the scale. I received two of these barometers, with twenty spare tubes filled and boiled by Dollond, to fit into the frames. I left one at Soobathoo, and the other which I took with me, together with six spare tubes, after an absence of five months returned in safety, and on comparison was found to be only .002 or $\frac{1}{500}$ part of an inch different from the former, and what was equally satisfactory is, that one of the barometers that we employed in 1818, which is still in existence, stood about $\frac{1}{20}$ of an inch higher than the mean of four tubes boiled by Dollond; so the heights observed in 1818, are if any thing under than above the truth. The difference may arise from the mercury which we used being of a less specific gravity than Dollond's, but from the want of a sensible balance we were unable to determine this.

At altitudes of 14,000 and 16,000 feet, we generally remarked that the mercury in the cistern of the barometer appeared as if adulterated with lead

or tin, and stuck to the fingers, but it seemed quite pure when we descended to lower places.

At lofty points of 15,000 feet and upwards, one tube was never trusted, but two or more were put up and they almost coincided. At the highest peak, where the mercury shewed 14.675 inches, three tubes gave exactly the same result.

The temperature of the mercury and air were particularly attended to, and observed with a very sensible Dollond's thermometer; the latter is by far of the most consequence; but I have even found the temperature of the mercury, from being exposed to a burning sun, 25° hotter than the circumambient air, which amounts to above sixty feet.

The temperature of the mercury was ascertained by making the bulb of a very small thermometer touch the tube of the barometer in several places, from twelve-and-a-half inches, the lowest part of the scale, to the top.

Baron De Humboldt remarks, that a considerable number of good observations made at the top of St. Bernard, prove that the whole of the barometrical calculations are too great or too little every time that the temperatures are above or below the mean temperature of the two stations, and also that the observations in the morning give the heights too little, because La Place's formula was deduced from observations made at noon.

The altitudes observed in 1818 and 1821, of which there were above a hundred at the same places, sufficiently prove this; but I shall leave others to decide how far it would be proper to compute the elevations from the mean annual tempera-

tures of the two stations; it is probable, however, that the heights of 1818 are nearer to the truth than the others, because they were almost all observed in October, which month, judging from the temperature at Soobathoo, is the mean of the whole year, whilst, in 1821, it was considerably above it.

M. D'Aubisson concludes, after having compared a great number of barometrical heights with exact geodesical measures, "that in avoiding the manifest causes of inexactness, such as the morning hours, the considerable changes of weather from one day to another, storms and the influence of localities, we may consider a hundredth as the limit of the mistakes." Judging from my own experience, I should think it rather more than this at different times of the year, but at the same season the difference is inconsiderable near the tropics. Shatool Pass, determined in 1820, by a barometer of my own construction, differs only two feet from that deduced in the following year by Dollond's mountain barometer; and the discrepancies are rarely thirty feet in altitudes of 10,000 and 12,000 feet; but at other times of the year, they are in a few places 100 feet, which, as the heights were calculated above Soobathoo, shew errors of $\frac{1}{70}$ or $\frac{1}{80}$; this, although more than what M. D'Aubisson says, is still a degree of accuracy that in many situations, such as the bed of a river confined between perpendicular cliffs, can rarely be obtained by any other method, and is correct enough for most purposes, such as determining the altitudes of villages, grains, and trees.

It is a well-known fact that the aerial tides are much more uniform within the tropics than in higher latitudes, and that the variation in the weight of the atmosphere decreases with the altitude of the place.

Baron de Humboldt observes, that near the equator the barometer seldom varies above $\frac{1}{10}$ of an inch, and on the high mountains not more than half that quantity.

There are a few heights to which we had no corresponding observations, but the flux and reflux of the atmosphere, and its monthly variations, are so regular in these latitudes (31° and 32°) that observations made under the most unfavourable circumstances will very seldom err so much as 200 feet.

At Soobathoo, the greatest difference yet observed is $\frac{7}{10}$ of an inch, and if we take the mean height as a standard, any other elevation calculated from it will, at most, scarcely ever err 350 feet from the truth; now, if regard be paid to the season of the year and hour of observation, (for the diurnal variations in the mercurial column, of which there are four, generally amount to $\frac{1}{10}$ of an inch, and are often more,) this error will, perhaps, be diminished to 100 feet, and correspondent observations will probably make it still less.

It is needless to put down all the barometric heights; but I have subjoined a few, at various elevations, and at different distances from Soobathoo, for those persons who may wish to re-calculate them; and these will show the degree of dependence that can be placed in barometric measurements. Where I had a sufficient number of

observations, as at Twaring, Soongnum, and Kotgurh, I have taken the highest and lowest of the barometer during each day, the attached thermometers at those times, and the greatest and least altitudes of the thermometers exposed to the air.

I have calculated most of the heights by two separate rules, so there is little chance of mistakes; where two heights did not differ much, each was computed only once, and their accuracy proved by allowing for the difference in the altitudes of the barometer, the temperatures of the mercury and air.

From the number of observations it will be seen that I have very seldom been obliged to depend upon a morning one, and, at most places, I had the choice of several at the best times of the day, so, upon the whole, it may be concluded that few of the altitudes are more than 100 feet wrong: at the highest stations the error may be a little more.

The noon observations generally give the heights more than I make them, because I have taken the mean of several, as approaching near towards the annual mean of the place, and thinking that five or six observations are better than a single one.

The following are some of the barometric observations where the greatest differences occur.

BAROMETRIC OBSERVATIONS.

1821.	SOOBATHOO.			TWARING.			
Day of Month.	Mean height of Barometer.	Temperature of Mercury.	Temperature of Air.	Mean height of Barometer.	Temperature of Mercury.	Temperature of Air.	Difference in Inches.
		°	°		°	°	
13 July	25.750	77.3	75.4	22.088	71.2	67.7	3.662
14 „	.702	79.3	76.	.059	70.3	73.2	.643
15 „	.665	78.4	77.3	.021	72.8	72.7	.644
16 „	.710	79.1	77.9	.080	68.8	70.	.630
17 „	.680	80.4	76.9	.033	70.6	68.2	.647
18 „	.670	79.9	77.2	.028	68.5	68.	.642
19 „	.663	76.9	75.8	.038	68.4	68.3	.625
Mean.....	25.691	78.8	76.6	22.050	70.1	69.7	
12. 3 P.M.	25.730	78.	76.	22.030	76.5	82.	3.700
17. sun-rise	.665	76.7	71.8	.081	64.	57.5	.584
	SOOBATHOO.			KEOOBRUNG PASS.			
		°	°		°	°	
24. 2 P.M.	25.690	80.5	80.	15.470	55.	44.	10.220
28. 11¼ A.M.	.794	78.	77.2	.469	54.	37.5	.325
	SOOBATHOO.			ZEENCHIN.			
		°	°		°	°	
25. 3½ P.M.	25.682	80.5	80.3	16.731	70.	53.5	8.951
26. sun-rise	.680	77.5	73.	.739	30.	27.	.941
10 A.M.	.750	76.	72.	.741	60.5	55.1	9.009
12 „	.730	78.8	78.6	.718	71.5	60.5	.012
3 P.M.	.700	81.	82.	.713	77.5	55.	8.987
27. 8 A.M.	.720	79.3	77.	.730	58.	49.5	.990
Mean.....	25.710	78.8	77.1	16.729	61.2		

Barometric Observations continued.

Day of Month.	SOOBATHOO. Mean height of Barometer.	Temperature of Mercury.	Temperature of Air.	NAKO. Mean height of Barometer.	Temperature of Mercury.	Temperature of Air.	Difference in Inches.
1821.		°	°		°	°	
7 Aug. 4¼ P.M.	25.668	79.	77.2	19.365	75.	67.	6.303
8 „ sun-rise	.675	76.6	70.5	.400	62.	52.2	.275
8¾ A.M.	.711	78.2	75.	.400	69.5	67.8	.311
10 „	.723	78.5	75.	.388	63.5	70.2	.335
12 „	.700	79.	79.	.357	70.	72.8	.343
3 P.M.	.667	80.	80.2	.322	73.5	74.6	.345
9 „ 10 A.M.	.700	78.7	77.	.384	64.	70.	.316
12½ „	.690	80.8	82.	.340	71.	73.1	.350
3¼ P.M.	.646	81.	80.	.306	73.5	75.3	.340
5½ „	.627	81.5	78.3	.301	74.	71.	.326
10 „ sun-rise	.660	76.8	71.7	.368	61.	54.	.292
8 A.M.	.717	77.7	74.1	.391	59.5	58.5	.326
Mean.....	25.682	79.	76.7	19.360	68.	67.2	.
	SOOBATHOO.				SOONGNUM.		
		°	°		°	°	
18 Aug.	25.635	77.5	75.7	21.205	71.5	70.7	4.430
19 „	.655	77.	75.3	.196	73.	71.1	.459
20 „	.650	79.6	78.1	.180	74.	71.2	.470
21 „	.665	79.3	76.5	.222	73.3	71.8	.443
22 „	.665	78.3	75.2	.228	73.5	69.	.437
23 „	.720	78.2	74.5	.218	72.3	71.1	.502
24 „	.702	78.7	74.	.232	72.1	71.1	.470
25 „	.710	78.9	77.5	.244	73.5	71.5	.466
26 „	.705	79.	77.	.267	71.8	68.6	.438
Mean.....	25.679	78.5	76.	21.221	72.8	70.7	.458
19, sun-rise	25.620	76.	69.5	21.268	67.	60.	4.352
4 P.M.	.660	81.	81.	.120	78.5	82.2	.540

Barometric Observations continued.

SOOBATHOO.				MANERUNG PASS.			
Day of Month.	Mean height of Barometer.	Temperature of Mercury.	Temperature of Air.	Mean height of Barometer.	Temperature of Mercury.	Temperature of Air.	Difference in Inches.
1821.							
30 Aug. 2 P.M.	25.755	79.5°	81.°	15.300	61.°	36.2°	10.455
7 Sep. 12 „	.843	76.	78.3	.294	64.	28.3	.549
SOOBATHOO.				TENGDEE OF PEENOO.			
2 Sep. 5½	25.720	77.°	75.°	19.500	68.°	64.3°	6.220
3 „ sun-rise	.680	76.5	72.	.529	56.	46.	.151
11 A.M.	.695	78.5	78.	.516	64.	62.	.179
12¼ „	.685	79.	79.	.481	76.5	78.2	.204
3 P.M.	.650	79.7	80.	.431	71.5	73.	.219
4 „ 7½ A.M.	.660	75.8	72.7	.471	62.5	50.6	.189
10 „	.700	75.5	73.7	.476	67.	56.	.224
1 P.M.	.690	77.3	77.	.432	67.	66.5	.214
4 „	.670	77.2	76.	.475	67.2	63.	.195
5 „ 8 A.M.	.760	75.	71.	.502	52.	50.	.258
Mean.....	25.691	77.2	75.4	19.481	65.2	61.	

The mean heights of the underneath have been deduced from the highest and lowest of each day.

1821.	Soobathoo 4205 feet above the level of the Sea.			Kotgurh.			
Day of Month.	Mean Height of Barometer.	Temperature of Mercury.	Temperature of Air.	Mean height of Barometer.	Temperature of Mercury.	Temperature of Air.	Difference in Inches.
		°	°		°	°	
25 Sept.	25.870	71.7	69.5	23.675	69.7	60.2	2.195
26 ,,	.910	71.2	70.1	.737	67.	60.	.173
27 ,,	.993	72.4	70.3	.777	68.2	64.	.216
28 ,,	.952	70.5	67.6	.750	68.	60.	.202
29 ,,	.850	66.9	63.1	.666	65.2	57.3	.184
30 ,,	.860	66.5	65.4	.692	67.2	56.	.168
1 Oct.	.875	68.1	66.9	.692	67.9	60.7	.183
2 ,,	.880	69.0	68.1	.681	67.2	59.2	.190
3 ,,	.865	66.3	66.4	.662	65.5	55.1	.203
4 ,,	.820	67.8	65.4	.674	63.5	53.7	.146
5 ,,	.830	65.9	64.1	.623	63.	53.3	.207
6 ,,	.837	66.2	65.	.635	65.	54.1	.202
7 ,,	.895	68.7	66.5	.690	64.7	54.	.205
8 ,,	.955	66.4	62.8	.736	64.5	55.1	.219
9 ,,	.933	65.2	64.	.728	63.8	54.2	.205
10 ,,	.910	65.8	64.1	.686	64.	55.3	.224
11 ,,	26.032	66.4	65.9	.803	66.	55.6	.229
12 ,,	25.963	68.2	65.5	.731	64.7	54.7	.232
13 ,,	.950	66.8	65.1	.757	64.5	54.2	.193
14 ,,	.982	61.5	64.	.796	63.1	49.8	.186
15 ,,	26.003	63.1	61.5	.760	62.5	50.4	.243
16 ,,	25.992	62.2	61.	.752	61.4	49.6	.240
17 ,,	.966	61.6	60.5	.738	61.4	51.1	.228
22 ,,	26.025	64.8	64.	.801	63.	53.9	.224
23 ,,	.080	63.7	65.	.835	63.	54.1	.245
24 ,,	.025	66.2	63.8	.778	63.7	54.3	.247
25 ,,	25.985	64.4	63.7	.742	62.5	53.3	.243
26 ,,	.975	64.3	63.	.735	62.9	52.6	.240
27 ,,	.967	63.9	63.	.707	61.9	52.3	.260
28 ,,	26.038	63.4	62.	.776	62.5	53.5	.262
29 ,,	.027	65.8	62.	.736	62.5	53.8	.291
Mean....	25.943	66.3	64.8	23.727	64.5	55.	
4 Oct. 4 p. m.	25.820	68.	70.7	23.680	64.2	55.	.140
29 ,, 10 a. m.	26.074	65.	65.	.771	61.	55.	.303

Twaring, by the mean of the seven days' observations, will be 4,353 feet higher than Soobathoo, and the two last observations where the differences are greatest, give 4,495 and 4,211 feet respectively, the errors are therefore + 142, and — 142 feet.

Keoobrung Pass was calculated from the mean of the two observations; I did not try them separately, yet it will be seen from the difference in the state of the air, that the altitudes will come within thirty feet of each other, although the variation of the mercurial column at Soobathoo at the two times is equal to about 100 feet of elevation.

If the morning observations at Zeenchin be taken, the height will be nearly 350 feet too little, and the noon ones will give about 200 feet more than I make it from the mean of all: this is the highest station where I had an opportunity of making several observations, and they do not agree so well amongst themselves, as at any other place; which is what might be expected, since the corrections for the thermometer increase with the altitude, and are greatest and least on elevated spots, because there the changes of temperature in twenty-four hours during summer are most: Zeenchin is also at the greatest distance from Soobathoo, being 2° east of it.

Nako, calculated from the mean of all observations, will be 8,059 feet above Soobathoo; the sunrise observations give about 250 feet less than the mean, and the noon ones nearly 100 feet more.

Soongnum by the mean, comes out 5,444 feet,

and the extremes at sun-rise and 4 P. M. give 230 less, and almost as much more.

The two observations at Manerung Pass agree within forty feet of each other, the mean being 14,407 feet higher than Soobathoo, or 18,612 above the level of the sea; a surprising elevation for a pass frequented during five months of the year.

Tengdee will be about 12,000 feet, and the difference not 100 feet.

Kotgurh by the mean height of the barometer, observed for thirty-one days, comes out 2,483 feet, or 6,688 above the level of the sea.

The last two observations shew the greatest extremes during the month, but it may be noticed that the one of the 4th of October at 4 P. M. was deranged by a violent storm. There was no storm at Soobathoo on that day, and I have seldom remarked such a sudden variation in the barometer, although I have sometimes seen the mercury rise and fall $\frac{1}{20}$ of an inch in a few seconds, during a continued gale of wind.

If Kotgurh be calculated from the two last observations, its altitude will be 2,415 and 2,566 feet above Soobathoo, the mean of which is 2,490 feet, differing only seven feet from its height, computed from the thirty-one days observations, viz. 2,483 ft. The error of each is therefore 68 and +83 feet, but this is a rare instance in so short an interval of time, although it may happen at different seasons of the year; the distance between the two places is about forty miles direct.

Suppose we compare the observations for deter-

mining the altitude of Kotgurh in 1818 and 1821. In the first year they were made in the month of November, and in the last during October, the temperature at these times being 50° and 55°, the former about 4° below the annual mean, so the last is probably most correct; in 1818 the barometer gave 2,429 or 54 feet less than in 1821, but in the former year the instrument was constructed by myself, and in the latter by Dollond.

Nako, by the observations in October 1818, comes out 7,800 feet, but those of 1821 give 8,059 feet, the former were calculated from a temperature of 38°, which is nearly the mean of the year at that place, so they deserve the preference, as the mean of the latter was so high as 62°.

It is needless to subjoin more observations, and the above, which comprehend those taken at the highest stations, where the differences are greatest, are sufficient to shew that the barometric formula requires some modification for different hours, as well as for different seasons of the year.

The elevated country within the lofty Himalaya, like the valley of Kashmer, is not deluged with rain during the three months that lay the whole of the plains of Hindoostan under water; on the contrary, in Koonawur, Kashmer, Chinese Tartary, and Ludak, July and August are by far the hottest months, as may be seen by reference to the temperatures; for instance, take Twaring, the difference of temperature between which and Soobathoo, is only 9°, equal to an altitude of about 2,700 feet, whereas it is 4,300.

Twaring of Murung lies between two lofty ranges of the snowy mountains, and is without the influence of the periodical rains, but the climate of Soobathoo is as much affected by them as the plains of India; therefore a person who has been subject to fevers for many successive years, during and after the rainy season, which is of very frequent occurrence in the plains, has every chance of escaping a return of his complaint by residing in the upper parts of Koonawur, from the middle of June till the middle of October.

A great deal has already been done by many distinguished persons in improving the barometric formula, but it is probably capable of still greater correctness, and it is to be hoped, that we shall one day have formula for different seasons, which would be of far greater consequence than for different hours of the day, as a person desirous of attaining accuracy may contrive to reach most places by noon, which appears to be a very convenient time.

I have compared ten stations whose altitudes were calculated by trigonometry, with their heights deduced by barometer, in the months of September and October; and in those of 6,400 feet, the disagreement was seldom more than twenty or thirty feet. This difference no doubt arose, partly from the barometer, and partly from the distances not being quite accurate, for they were ascertained by differences of latitude, from a great many north and south stars, generally those for which Dr. Woollaston has given the corrections to every 10th

day of the year, and likewise from the stars in Dr. Pond's catalogue of 400, published in the Greenwich observations for 1817.

The corrections for the barometer and thermometer, were taken from the table in the Ephemeris for 1822, and the latitudes by Troughton's reflecting circle very seldom differed 7″ from the result by a repeating circle.

Baron Zach, whose authority is of great weight, concludes, "that an error of 5″ or 10″ may remain undiscovered, in the mean of many hundred observations with the twelve inch repeating circle of M. Reichenbach;" how far my latitudes are correct, I have had no means of deciding, but from the north and south stars giving the same latitudes, it is probable that the error, if any, depends upon the construction of the instrument, and remains constant or nearly so.

At Soobathoo, where I got several hundred observations, the mean of the two circles agreed within $\frac{1}{2}$″ and two sextants within $1\frac{1}{2}$″ and 2″ of the determination by the circles.

In the calculations for the heights, the refraction was reckoned at $\frac{1}{15}$ of the intercepted arc, agreeably to what I found it from a number of observations made at heights from 2,000 to 10,600 feet; from want of another observer there were intervals of two, three or four days between taking the elevations and depressions, but the refraction varied from $\frac{1}{13}$ to $\frac{1}{16}$, and was only once $\frac{1}{17}$. Another proof that this estimate is not far wrong, is, that the Purgeool Mountain was calculated from eight stations, whose altitudes were determined by barometer,

from 9,000 to 19,000 feet above the level of the sea, at angles from four to twenty-four degrees, and distances varying from two to thirty miles; and the greatest difference between any two does not amount to 250 feet, and the highest point of the Ruldung Cluster 21,100, feet calculated from the Fort of Huttoo, fifty-three miles distant, whence it is visible under an elevation of 1°.47′, scarcely differs 200 feet from what the observations from a station near Rogee give, where the distance was only eight miles, and the angle of elevation fifteen degrees.

The altitudes cannot be very erroneous, since the small ones were observed with a theodolite reading off to 10″, and the large ones with the circle and artificial horizon, and very often by both instruments. Another instance of the accuracy of barometric observations may be given. In the middle of October 1818, our camp at Nako, from the mean of many observations, appears to be 11,995 feet above the sea, and the High Peak where the barometer was 14.675 is 7,416 above it, or 19,411 feet from the surface of the sea.

This being a principal point, and I believe the greatest height ever attained on the earth's surface, either in India or any other country, I was at some pains to determine it, in 1820, by trigonometry. I measured a base of 219 feet by a chain which I compared with a Dollond's standard brass scale of five feet, and corrected it for the temperature; I tried it thrice, and the greatest difference was $\frac{6}{10}$ of an inch. By taking a station forming nearly an isosceles triangle with the base, I got a space of almost 3,000 feet to determine the distance, which

was not five miles; stone pillars were erected at each of the places, the horizontal angles were repeated several times round the theodolite, and were also observed with Troughton's circle, and reduced to the horizon; the vertical ones were likewise taken with both instruments, and those by the circle were corrected for the distance of the mercury, and the agreement was very satisfactory. The altitude of the high point, calculated from each of the stations, shewed only a difference of seven feet; so upon the whole I do not think the error amounts to above twenty feet. The result gives the Peak 7,447 feet above our camp, or thirty-one more than the barometer; so the station which we visited, in 1818, is certainly 19,400 feet: high probably 19,450 is more accurate, since the barometer by which Nako was determined was .050 too high, and the observations taken in 1821 with Dollond's mountain barometer, indicate an elevation of almost 12,150 feet for our camp near Nako.

The fact of water boiling at different altitudes according to the density of the atmosphere, was known long ago, and is an experiment exhibited in every class where natural philosophy is taught; but Colonel Hodgson, the late Surveyor-general, is the first person in India who thought this method sufficiently accurate for determining heights; and when his barometer was broken, he adopted this plan with success in 1816, for the measurement of many places in the Himalaya mountains. Our trials in 1818 have proved, that even a common thermometer may be successfully employed in the absence of barometers, which are liable to many accidents.

In making observations for the height of the boiling point of water, three things should be particularly attended to; in the first place, the thermometer ought to be compared with one that can be depended upon, or with a good barometer, to ascertain its error; secondly, the water should be pure, being either distilled, or snow water, and thirdly the temperature of the air ought to be observed. The boiling point of water being ascertained, the corresponding altitude of the barometer may be inferred, whence the elevation of the place is calculated according to the barometric formula.

Thermometers constructed by Messrs. Troughton, Dollond, (not Dalland) Berge, and Carey, may be reckoned correct, but the common thermometers made by obscure artists are not to be trusted, the boiling point being often two or three degrees wrong. This arises principally from thermometers being constructed without regard to the height of the mercurial columns at the time; the artists abovementioned make an allowance for the height of the barometer, so that the boiling point of water may be 212°, when the barometer marks 30 inches.

The following are extracted from above a hundred observations at various heights.

Barometer observed.	Boiling point observed by large Thermometer.	What it should be according to Dalton.	Error of Thermometer.
14.67	180°	179°.3	+ .7
17.33	186 .4	186 .1	— .3
18.23	188 .5	188 .4	— .1
19.45	191 .5	191 .4	— .4
20.56	194 .3	193 .6	— .7
21.48	196 .1	195 .6	— .5
22.24	197 .5	197 .1	— .4
23.86	201 .5	200 .5	—1°.0
	Small Thermometer		
17.33	187°.5	186°.1	+1°.4
19.02	190 .3	190 .1	— .2
20.57	194 .1	193 .6	— .5
21.64	196 .3	195 .9	— .4
22.50	198 .5	197 .8	— .7
23.73	201 .0	200 .3	— .7
25.08	202 .9	202 .9	— .0
27.06	207 .0	206 .6	— .4
29.31	211 .0	210 .8	— .2

The large thermometer was a foot long, and the smaller one six inches; they were made by Adams, and were both too high on comparison with a thermometer made by Dollond, which appears to be correct. The error of the former seemed to be + .5 and that of the latter + .7, these numbers are therefore to be subtracted from the foregoing observations: in the whole hundred observations, the large thermometer never errs above .6, or 300 feet, and the small one is only thrice 1°. or 500 feet wrong; so a much greater degree of accuracy might be obtained by one fitted up with a vernier and a magnifying glass. A degree at the boiling point answers to about 500 feet of elevation, and it may certainly be

subdivided by means of a nonius to $\frac{1}{10}$ part; I understand that Dr. Woollaston's thermometrical barometer is capable of surprising exactness, but it can never supersede the use of the mountain barometer, for finding the flux and reflux of the atmosphere; and besides, there is a great inconvenience attending boiling water. You must always have dry fire-wood, and in elevated places that article is frequently difficult to be procured, and in bad weather, such as I experienced in crossing Charung and Gangtung Passes, it would have been impossible to light a fire, from the drifting sleet and snow: another thing is, not always being able to get pure water.

However, as barometers are liable to many accidents, and since the thermometer has been proved so accurate, (the greatest error with one of only twelve inches, being but 300 feet,) this mode is certainly worthy the attention of philosophers, and a two feet thermometer with a nonius, might give the altitude to fifty feet; but it will still, however, be liable to the same uncertainty as the barometer.

If M. Biot's formula be used, the above observations will be rather wider from the truth, but if I remember rightly, Professor Playfair gives the preference to Dalton's method.

Since writing the above, my brother James, who accompanied me to the High Peak, near Nako, in 1818, visited the same place, in 1820, with two barometers, which both agreed, and they give his station, (which was ten feet higher than our former one), 19,725 feet above the level of the sea. My brother has likewise visited another point on the same ridge, no less than 20,400 feet high.

A thermometer for the purpose of determining heights by the boiling point, need never extend below 176 degrees, so no more than thirty-six degrees are required, and if these be marked off on a scale of one foot, about $\frac{1}{3}$ of an inch will be equivalent to 500 feet, which appears to be sufficiently accurate.

By extending the thirty-six upper degrees to two feet or more, the accuracy will be augmented; but it should be kept in mind, that at the same time the risk of breaking is much increased: so much so, indeed, that the trifling approach of a few feet nearer the truth, does not at all compensate for the additional length of the thermometer, and consequent liability to accidents incident to travelling in rugged and mountainous countries.

TRADE.

Almost all the trade is conducted by barter.

The Koonawurees take to Ludak, Kharwa or strong red cotton cloths, white cotton cloth, and chintzes of various sorts both coarse and fine, a little broad cloth, a few silks, gongs or large circular metallic instruments struck with a hammer, and used by the Lamas in their devotions, iron both wrought and unwrought from Nawur, and Kootlaha of Busehur, Tutenag or spelter, lead from Sirmour and Jounsar, copper and brass pots, matchlocks, straight swords, sabres, shields, bows and arrows, knives, scissars, spectacles, looking glasses, Sunkhs or sacred shells used by the Hindoos and Lamas in their religious ceremonies, crystals, precious stones, sandal-wood, Porwa or vessels of

juniper-wood made at Soongnum and Ropa, in Koonawur, and much resembling Scotch cogs, otter skins, called "Ootur," indigo, oil, ghee, or boiled butter, opium, tobacco, rice, wheat, barley, walnuts, apples, raisins, almonds, Shungtee, or Neoza, the seed of a pine, peculiar to Koonawur and other mountainous districts where there is no periodical rainy season, and in taste similar to the pistachio nut, cloves, cinnamon, nutmegs, cardamums, Misree, Goorh, Cheenee and Shukur, four different kinds of sugar, sheep and goats, and Rakh, a spirituous liquor distilled from the grape in Koonawur.

The Koonawurees bring back,

Kesur, or saffron, produced chiefly in the hill state of Kooshtwar, N. W. of the river Sutluj, coarse shawls manufactured in Ludak, Numdas, or felts, Dochuks, or ingots of silver, Soom, a kind of blanket dyed red and blue, Thermas, Goodmas, Punkhees and Pushmeenas, four sorts of woollen stuffs, the latter of shawl wool, Bulghar, or Bulkhal, or skins of red Russian leather, Tincal and borax.

Merchants from the Punjab take to the Capital of Ludak chiefly by the Chumba road, red goats' and sheeps' leather, which is bought by the Mooghuls of Yarkund for boots, match-locks, sabres, shields, all kinds of cloth and chintzes, spices and sugar.

They bring back,

Saffron, borax and Tincal, agate, which is made into ornaments at Lahour and Imrutsir, musk bags, tea, ingots of silver, some shawls, shawl wool, woollen stuffs of various kinds, a few raisins, felts, Nirbissi, or Zedoary, and the manufactures of China.

The Yarkundees take to Leh of Ludak, pearls, felts, silks, satin, and velvet of many varieties, both coarse and fine, from China, furs of otter, sable, &c. China tea-cups and saucers, coral beads of various sizes and colours, seed-pearl, Bulgars, Dochak, called also Dusat, and in the Turkish language Yambo; these are bars or ingots of silver stamped with the Yarkund seal, and they weigh from two to four pounds each, and are sold accordingly.

They receive in return,

Nirbissi Zedoary a medicinal drug reckoned a cure for the bite of a snake, and most disorders, gold and silver brocades, red goats' and sheeps' leather in large quantities for boots, white cotton cloth and chintz of many kinds from Mooltan and Samba, and various other coloured cotton goods, spices of all sorts, Kim-kabs, or silk worked with gold and silver flowers, taffetas, another kind of silk stuff, muslins, Baftas, embroidered cloth, and various silk stuffs manufactured at Benares.

The Tartars from China take to Leh, tea of two or three kinds, silks, gold and silver brocades, blankets of various sorts, shawl and Beangee wool, silks, satins, and velvets, from China, cups and saucers, ghoonts or hill ponies, mules and asses, sheep and goats, and every thing that reaches Garoo from Kumaoon.

They bring back,

Sugar from Kashmer and the plains of India, of different sorts, as Goorh, Misree, and Shukur, shawls, coral, pearls, beads, Dusat, Baftas, Bulghars, felts, spices, brocades, match-locks, swords and shields.

The Kashmerians bring to Leh and Garoo,

Dried fruits, such as plums, apricots, figs, raisins and currants, shawls, tobacco, Goorh and Shukur, paper, dates, almonds, saffron, lacquered ware, cutlery, wine and spirits.

In return they take back,

Shawl wool in large quantities, tea, Beangee wool, some china cups and saucers, silks, and brocades.

As I am now speaking of the trade, it may be as well to mention the exports and imports of Garoo in Chinese Tartary.

The Koonawurees take to Garoo the same things as to Leh, with the exception of goats and sheep, which are abundant in that country.

In exchange they bring back,

Much rock-salt which is dug out of the lakes, Beangee and shawl wool, the produce of the Tartar sheep and goats, gold dust, tea and borax, Nirbissi or Zedoary, a few shawl goats and Beangee sheep, and large Tartar dogs of a very ferocious breed, which guard their flocks from panthers, leopards, and other wild beasts, and are excellent watch dogs for preventing bears from committing ravages amongst the vineyards.

The merchants from Kumaon take to Garoo,

Pearls and precious stones, such as coral, agate, Feeroza, or turquoises, beads of many varieties, Cowrie shells for ornaments, quicksilver, iron, brass, lead, Tutenag or spelter, copper, otter and fox skins, and other furs, cinnabar, musical instruments, particularly long brass trumpets that draw out to four and five feet, gongs, cymbals, and conchs or sunkhs,

knives, spectacles, scissars, looking-glasses, snuff-boxes, small telescopes, match-locks, stick lac, swords, sabres and shields, rice, wheat, barley and other grains, dry tobacco, cloves, cinnamon, pepper black and red, cardamums, nutmegs, sandal wood, almonds, dates, Goorh, Shukhur, Misree and Cheenee, Ghee, oil, manna, amber, indigo, paper, leather of different kinds and colours, Kharwa, European, and Indian chintz, and cloth of all sorts, Mushroos, and other silk stuffs, kim-kabs or brocades, Porwa or wooden vessels of juniper, broad cloth, of which the two-coloured are most prized, red on one side, and blue on the other; but particularly red on one side and yellow on the other, these being the two sacred colours amongst the Lamas, and the latter the imperial colour of China.

They receive in return,

Salt, borax and Tincal, blankets, and other woollen stuffs, musk, gold dust, silver ingots, ghoonts, goats, sheep, a few shawls, tea, Beangee wool, and some China silks, cups and saucers.

Garoo sends to Ludak, shawl wool in abundance, for the Kashmer market, gold, silver, musk, furs, leather, and tea of several sorts.

GEOGRAPHICAL POSITIONS.

The relative positions of the following places are perhaps not far wrong. The length of a stage was taken at from eight to ten English miles in direct distance, according to the nature of the road; as I had a pretty long line, and the routes form good angles, the situations of Kashmer and Leh are certainly more correct, than usually in maps. My line extends from Husunabdal on the Hon. Mount-

Stuart Elphinstone's route, to Garoo. In the first place I fixed the capital of Kashmer, by routes from Lahour and Husunabdal, measured by some of the Emperors of Hindoostan, reckoning the deductions what I have found them in similar countries: from Lahour to Soobathoo, was surveyed by me with a compass and perambulator. I paid particular attention to the bearings of the road; and as the line is nearly east and west, the difference of longitude cannot be far from the truth. In the Hills, I carried on the survey trigonometrically from Soobathoo as far as Bekhur, the most eastern point, in long. 79', and to the north to Shealkhur and Dankur, in lat. 32° 5′ 36″. Eclipses of Jupiter's first satellite were observed at Penoo and Soongnum; and they give the same result as the survey.

From Soobathoo to Mooradabad I got a series of peaks, which give the difference of longitude exactly the same as Jupiter's first satellite, of which I got several observations at the latter place.

From Mooradabad I surveyed to Roodurpoor and Bhurmouree, on Captain Webb's route, which extends to Budrèenath, whence Captain Hearsey's survey reaches to Garoo and Mansurowur.

The routes from Kashmer, Imrutsir, Bilaspoor, Dankur, Shealkhur, and Garoo, to Leh, make considerable angles, and certainly give the situation of the capital of Ludak nearer to the truth than either Lieut. MacCartney's or Mr. Fraser's positions, each of which was settled by a single route only, and estimated bearings by natives.

The longitudes have been reckoned from Soobathoo, which I fixed by many immersions and

emersions of Jupiter's first satellite, compared with the Marseilles' observations, the greatest difference between any two observations being one and a half seconds in time.

	Latitude.		Longitude.	
Mooradabad	28°. 50′	(1)	78°. 45′	(6)
Budreenath	30 . 44	(2)	79 . 34	(7)
Mansurowur	30 . 50	(3)	81 . 15	(8)
Loodheeana	30 . 54	(1)	75 . 50	(9)
Soobathoo	30 . 58	(1)	76 . 59	(6)
Neetee Pass	31 . 0	(3)	79 . 54	(8)
Chubrung	31 . 15	(3)	79 . 42	(8)
Thooling	31 . 17	(3)	79 . 45	(8)
Bilaspoor	31 . 19	(1)	76 . 45	(9)
Lahour	31 . 30	(1)	74 . 18	(9)
Imrutsir	31 . 32	(1)	74 . 47	(9)
Bekhur	31 . 36	(1)	79 . 0	(9)
Garoo	31 . 40	(3)	80 . 21	(8)
Shipke	31 . 49	(1)	78 . 44	(9)
Shealkhur	32 . 0	(1)	78 . 34	(6)
Dankur	32 . 5	(1)	78 . 12	(6)
Leh	33 . 48	(4)	78 . 13	(10)
Kashmer	34 . 0	(5)	75 . 17	(11)

No. 1. Latitudes observed by me.

2. Do. do. by Messrs. Raper and Webb.

3. Deduced from Budreenath by Captain Hearsey's survey.

4. Deduced by me, from the number of days' journey from Shealkhur and Dankur.

5. Deduced by me from Lahour, according to the distance measured by the Emperor Akbar.

6. Longitudes observed by me, and compared with the Marseilles' observations of Jupiter's first satellite.

7. By Messrs. Raper's and Webb's survey.

8. Deduced from Budreenath, by Captain Hearsey's survey.

9. Deduced from Soobathoo by my survey.

10. Deduced from the number of stages from Kashmer to Garoo.

11. Deduced from the measured distances from Husunabdal (on the Hon. Mount-Stuart Elphinstone's route to Kabool), and Lahour, by Emperor Akbar.

Since the above was written, I have received the latitudes of the capitals of Kashmer and Ludak, from Mr. Trebeck, the companion of the late Mr. Moorcroft, as follows :—

Kashmer	34°. 4
Leh	34 . 9

A map of the countries north of the Sutluj was made out by me in 1821, and two copies of it were forwarded to the Marquis of Hastings by the late Sir D. Ochterlony, but I understand that they were never received by the Government. Since that time, a reduced map of the above-mentioned tract, by me, has been published by Dr. Brewster in his Philosophical Journal.

CONCLUDING REMARKS.

A few of the foregoing notes occurred to me after reading Mr. Fraser's book, which I did not see until I had completed the above account of Koonawur. It will not appear strange that some of my remarks differ from Mr. Fraser's, since he got his information from but few people; he never entered Koonawur, and, I believe, he collected almost all his knowledge of that country from a single individual.

The principal discrepancies occur in the distances and difficulties of the road.

Mr. Fraser performed the first part of his journey when the Gorkhas had possession of several posts in the country, and the latter part immediately after we had established our power, and as Mr. Fraser himself says, when the people were wavering.

This was not a time for obtaining much correct

information, as the natives, after groaning so long under the Gorkha tyranny, would naturally enough view their European conquerors at first with suspicion and jealousy, and Mr. Fraser would only see the worst part of their character.

It was not my plan to make any observations on the inhabitants of the lower hills, but it is only justice to state, that I have found them liberal and obliging, and I have very seldom seen any of that cringing manner spoken of by Mr. Fraser; on the contrary, they have usually evinced a degree of independence that I have often admired. Neither do I remember their shewing any obstinacy, but, no doubt, their manners have changed since they found themselves no longer under the arbitrary rule of Gorkha tyranny.

Mr. Fraser remarks the vicious propensities of the mountaineers more than once, and, indeed, he paints their character in the most horrid and frightful forms; for instance, he says, a person will kill another for no other purpose than to enjoy the pleasure of seeing the blood flow!!!

This is by no means the character of any of the mountaineers that I have seen, and I have travelled over almost every part of the hilly country, west of the Tons River, that was visited by Mr. Fraser, and much more besides in other places. As to their vicious propensities, some of the ruder tribes formerly carried off sheep and goats; but they have left off that practice, at least west of the River Tons: private stealing is almost unknown, and of all the many Europeans who have visited the part of the hills of which I am treating, none of them

ever lost a single article. I have often travelled over this tract without a guard, and had I occasion to go through it again I would never take a single Sepoy.

In the lower hills, murder is, perhaps, as frequent as in most districts in India, but it in general arises from a barbaric fine sense of feeling; it usually at first begins by some person being killed in an affray, and, if he had even been the aggressor, the nearest relation to the deceased reckons his honour at stake if he do not retaliate upon the first favourable opportunity: the other family then retaliate in their turn, and so on from generation to generation. I have heard of several of these blood feuds that had continued 150 and 200 years; they exist at this moment, and were it not for the dread of the British power, the people say that feuds would be carried on as formerly: but even now, a spirited youth sometimes starts up, sets our power at defiance, revenges his father's or brother's death, and escapes across the Sutluj. And he is much to be pitied, for if he take no notice of it, his life is miserable, and he is reckoned an outcast and coward, since the British Government can afford no redress regarding feuds of so long standing. Indeed, the people say, "better death or banishment than disgrace," for they consider it honourable to exile themselves from their country, on account of having deprived of life the murderer of one of their near relations.

A. GERARD.

Gurrawara,
17*th November*, 1831.

JOURNAL

OF

A SURVEY

FROM

SOOBATHOO TO RARUNG.

1817.

JOURNAL.

1817.

August 27, 1817. Syree 11m. 2.5f. Left Soobathoo at 5 A.M. The first two miles and three quarters being along the road I travelled last year on the way to Soorujgurh, I did not survey it. The next half-mile was first an ascent, and then a rather steep descent to Jugat Khana: here, crossed the Dubur Khud, and proceeded up the left bank of the Gumbur, for one furlong; crossed the stream, which is rapid, and two feet deep. It is here confined in a narrow bed, between pretty high hills of clay-slate, which rise abruptly from the river at an angle between 60° and 70°. After crossing the Gumbur, the road for one furlong was difficult, and lay over abrupt and rugged rocks; the Suruk being to the right, and at present under water. Fifty yards further, crossed the Kooneear Khud, and ascended gradually for five furlongs, slanting upon a left hand range, with the Gumbur about a quarter of a mile on the right, to Huree-

poor, a large village. From thence the road for five furlongs was similar upon soil to the village of Puratha. The next mile and a half, with little variation, was a slight ascent upon an irregular ridge branching to the right and left, and covered with grass and some Kanta bushes. The road for two miles further was good and even, upon a right hand range to Mumleeg Choukee, where there is a small tank. The road then was first a rocky ascent of a quarter of a mile, and afterwards indifferent for one mile upon the face of a range, which sometimes lay on the right and sometimes on the left. The next five furlongs were bad and rocky, upon a left-hand hill; and the rest, a distance of one mile one furlong, good and even, upon a range to Camp, near a Boulee, one furlong beyond the deserted village of Syree, where I arrived at 1 P.M.

The hills, to-day, were all clay-slate, with small pieces of quartz intermixed in a very few places. The general direction of the strata was N. W. and S. E.: the angles of inclination very different, and dipping to the S. W. They are mostly clothed with grass, but have a few shrubs upon them. The country is well cultivated around Hureepoor, and near the villages in the dells, and on the banks of the Khuds to the right and left; but there is very little cultivation on the road side. Saw a great deal of sage to-day, which is not quite the same as the European plant of that name. The perambulator got out of order, and the distance is about six furlongs too short. The error appears to be a little to the S. W. of Mumleeg.

August 30, 1817. Juko, 10m. 2f. Thermo-

meter at sunrise 61°. clear. Marched from Syree at 5h. 30m. A. M. Road for the first mile and a half was good and even, except the latter one hundred yards, which was a slight ascent round a left-hand hill to Rutnaon Ghatee. The next mile and three quarters was fine even road, mostly upon a right-hand hill to Jantee Debee. From thence there was an ascent rather steep in a few places, upon a ridge of about a mile long, and then a bad and very rocky descent of three furlongs to the Chand Nudee, a fine rapid stream running to the right. Thus far the road lay over clay slate. After crossing the Nudee, there is a tiresome and steep ascent of a mile and a half to the top of Buteeooreea Ghatee all the way over micaceous slate. Here, found the heat of the sun very great, by reason of the reflection from the bright mica. In hot weather this ascent is exceedingly fatiguing, and as there is no stream or boulee between the Nudee and Semla, a Fakeer is stationed at the pass to give water to travellers, from whom he receives a small trifle in return. From the Ghatee to Semla, a distance of about three miles, the road is much the same, being good, plain, and generally broad, over soil. The first half mile it lay upon a right-hand hill, and through oak and boorans; the next half mile upon a left-hand hill, and likewise through oak and boorans, and the rest of the way sometimes upon the top of the range, and sometimes on one side through cheer and keloo trees. Reached Semla, a middling sized village, at 12h. 30m. P. M. Stopped here during the day, and at 5h. P. M. marched to Juko, distant one mile and one furlong,

and encamped at a hut about sixty yards S.W. of the flag staff, near a small tank almost dry. The road from Semla was an ascent the whole way, steep and rocky in several places, and through keloo and oak trees with very thick underwood, which is full of bears and hogs. The rocks from Syree to the Chand Nudee are all clay slate; from thence to Semla there is a great deal of mica, and the hill of Juko is composed of a dark blueish limestone. There is so great an irregularity that neither the direction of the strata nor inclination could be got with any accuracy. The country appears to be well cultivated on the banks of the rivulets, but not near the road. Juko lies at some distance on the right of the Suruk, but I went to it in hopes of getting some observations for the latitude; however, the first part of the night was rainy and cloudy, and the latter so windy, that with all the blankets I could muster the mercury would not remain steady. Had a very extensive and beautiful prospect, and was lucky enough to get the bearing and altitudes of all the principal peaks. The Himalaya appeared very grand, extending in a long line from about east to west, but no remarkable point was visible. The distance to day is nearly a mile too little, as the perambulator went wrong.

August 31, 1817. Muhasoo, 7m. 6f. Thermometer at sunrise 54°.5 clear. Left Juko at 11h. 30m. A. M. The first five furlongs was a descent down a hill through oaks: roads very steep and slippery from the long grass. Here joined the Suruk or made road, which is good and even for three quarters of a mile, slanting upon a left-hand range and over

broken slate. The next mile and a quarter was similar, with two short steep descents and an ascent at the end. The range, covered with oaks on the north face and Keloos on the south, lying on the left. From thence the road for one mile was upon the top of the Dhar, the first half-mile good and level, and the latter part a steep ascent upon soil with oaks to the left and Keloos to the right. Then for two miles the Suruk was fine and plain, upon a left-hand Dhar covered with a very thick forest of Deodars. Five furlongs further arrived at a tank; road, a descent through pines upon the summit of the range. The rest of the road, one mile and a half, was first five furlongs a steep ascent upon a right-hand hill and through Keloo trees: latterly a more gradual acclivity, with the range lying to the left, and through a forest of a kind of holly, called Mouroo, to camp at Musoo Deota, where I arrived at 4h. 30m. P. M. The hills are composed of clay slate, crumbling easily and forming a rich black soil which is deep, and produces oak and the spices of pine, called Deodar or Keloo. Many of the latter trees are large and high, and covered with creepers to the branches. The country is well cultivated and populous in the dells, but there are no fields near the road, which is upon a high range the whole way. The houses appear to be well built of stones without cement, and are covered either with slates or shingles of the Keloo wood, which is very durable. Several of the Deota's shrines are very like Chinese temples. The slates used are greyish and cannot be cut thin, and the roofs in consequence are exceedingly heavy. Water is distant from

Muhasoo upwards of a mile, and there are no supplies to be procured nearer than Bunee. On the road to-day passed a great many people carrying iron to the plains: the loads are immense, being three Kucha-Muns: I can lift one not very easily, and it is astonishing how they manage to get them up the steep rocky ascents. This is the most elevated point in the whole range, and the climate is delightful. There are a quantity of European plants in the vicinity; strawberries abundant, and the maple and black-currant found in a few places. Got the sun's azimuth pretty correctly by the mean of six observations not differing more than 30″, and likewise the bearings and altitudes of all the remarkable points. At night tried to get an observation for the latitude several times, but could not succeed owing to the very strong wind.

September 1, 1817. Theog, 8m. 3.5f. Thermometer at sunrise 49°.5 rather misty. Marched at 11h. A. M. The road for a mile and three quarters was in general good, chiefly a descent, in a few places steep, upon a range which first lay upon the left and latterly on the right, the whole way upon soil and through a thick forest of Keloo and Ro'oo trees, a species of pine which grows high and is often covered with moss: then for half a mile there was a slight ascent still through pines and upon a right-hand range. The next two miles and a quarter of the road was capital and even, over soil of clay-slate, with the Dhar on the left. There are no trees on the way, but towards the bottom of a deep right-hand dell there is a thick holly forest. Here crossed the ridge and proceeded for a quarter

of a mile upon the N. W. face through holly and on even ground, then recrossed the range and had plain road for one mile and a half, the Dhar lying on the left well-clothed with grass but unwooded. The latter two miles to camp was good. The first half a mile of the way upon the top of the range covered with pines on the northern slope: the next half mile crossed and recrossed the ridge, which is covered with holly and oaks to the left, and the rest was a slight ascent upon a right-hand range to camp, where I arrived at 5h. 30m. P. M. The road to day was in good repair, with no great ascent or descent. It winds much upon a pretty high range, which is mostly of clay-slate with a great quantity of soil. The country is amazingly populous and well cultivated on the banks of all the rivulets, and the crops appear luxuriant. The villages are numerous and the houses well built as before described. The Deota's shrines, which are innumerable, are of stone and high, giving them the appearance of square towers; the roofs project much and are often ornamented with carved work in wood, looking like Chinese buildings. The night was cloudy and I could only get one bad observation of δ Aquilæ, which gives the latitude near 30″ higher than the reckoning, for which reason it is omitted.

September 2, 1817. Mandunee 11m. 3f. Thermometer at sunrise 55°.5 clear. Marched at 9, A.M. The road, for one mile, good and even, upon a range, the first part of the way lying upon the left, and latterly upon the right, with keloo and mouroo trees in the dells. The next mile was a slight ascent

upon a left-hand range of crumbling micaceous slate to Kunag Ghatee. To the right below are many fine large pines; then, there was a mile of tolerable road, chiefly a descent, in some places steep, to a dirty tank; from here the Suruk was good, and no great ascent or descent upon a left-hand range to Punta Ghatee, whence there was a descent of two miles and a quarter, winding upon a left-hand Dhar to Muteeana. The first part of the way the declivity was gradual, and the rest very steep. From the village, the road was generally a descent of a mile and a half, pretty good to the Kuljehur Nudee, a tolerably large stream, moderately rapid, passing to the right and dividing Keoonthul from Koomarsaeen. After crossing the Nudee had a steep ascent of nearly a mile to Jokta Ghatee. Here found the heat oppressive, and the ascent tiresome: from the Ghatee to Camp, one mile and one furlong, the road was good, and mostly a slight descent upon a left-hand range to Mandunee, a large village where I arrived at 4h. 30m. P.M. The Suruk, from Theog, with the exception of half a mile, lies upon a left-hand range all the way, and winds a good deal. It is a descent to the Kuljehur, and from thence mostly an ascent. The hills are either of mica or clay slate, in general unwooded near the top, but below there are some mouroo trees and a few pines. There is a great deal of cultivation near the Khuds, but the country does not appear to be so well inhabited as what I passed through yesterday. There is a Deota here, and also a handsome Debee built in the Chinese style, with a projecting cupola roof. The

inside is all wood, in many parts of carved work. I reckon this place to be fully 1000 feet lower than Theog.

September 3, 1817. Hutoo, 10m. 2f. Thermometer at sunrise 58°. Left Mandunee at 7 A.M. The road for the first five miles and a quarter, to Jurehra, was good and similar, being ascents and descents, a few of them steep, crossing many rivulets, and running parallel to, and at a short distance from, the right bank of the Seel Nudee: all the way upon the face of a left-hand range of mica slate, the summit of which in several places is considerably more than 1000 feet above the road: the Dhars sometimes covered with pines and holly, sometimes bare, with nothing but short grass. Across the Seel Nudee is a continuation of the Hutoo range, in general well clothed with pines of different kinds. From Jurehra to Nag Kanda Ghatee the road was an ascent of one mile and a half, not very steep but often rocky, still upon a left-hand Dhar and over micaceous slate with some few pieces of quartz intermixed. There are pines and holly trees here and there, but not in any great quantity. The Seel Nudee, which lay to the right two or three furlongs distant, has its source near the Ghat. After leaving the Kotgurh Saruk at the Pass, turned to the right and proceeded along a footpath, the first mile of which was good and mostly upon the summit of the range, which is thickly covered with Khuroo trees. Here got a sight of several forts across the Sutluj, and took the bearings of them. Marched to Hutoo, a distance of two miles and a half, an ascent almost the whole way, steep and

rocky, on the top of the range and through a forest of various sorts of pines and holly, with a small quantity of hill bamboos, interspersed and much thick underwood. Arrived at 2h. 45m. P. M. The kinds of trees seen on this march are as follows: the Keloo or Deodar, Ro'oo and Pundro, which are varieties of the pine: a species of larch: the Thoono or yew: and two sorts of holly, the Khuroo and Mouroo: likewise observed a few currant bushes, differing little from the European plant, one of which has very large leaves and another small. The hills are all composed of micaceous slate and gneiss; latterly, with small pieces of quartz disposed in veins. Here the rocks lie in immense detached masses, the direction of the strata being N. 36° E. and S. 36° W., inclined to the horizon at an angle of about 10°. The country is not so well cultivated as in the former marches, but the banks of the Seel are lined with many hamlets and villages, near which there are several peaches and apricots, and a few apples; but from the great backwardness of the season none of the fruit is ripe, and perhaps it may not come to maturity this year. The name of this place is Hutoo or Watoo. There are two Forts here, which scarcely deserve the appellation, being not larger than houses, and built like those of this part of the country, of stone without mortar. I was lucky enough to get the bearings of almost all the surrounding villages, but the haze would not admit of a distinct view of the distant Peaks. The mean of twelve observations of the sun's azimuth, gave the variation of the compass 2° 6′ 16″ additive, the extreme difference of any

two being 40″. At night there was a violent wind, which shook the mercury so much that it was impossible to observe the latitude.

September 4, 1817. Kotgurh, 7m. 1.5f. Thermometer at sunrise 44°. 45; misty and windy. Left Hutoo at 11 A.M. The road for the first mile was a steep, difficult, and rocky descent, down the side of the Hutoo range; then for two miles it was a more gradual declivity, and sometimes plain, with the range lying for the most part upon the right. The hill has much soil upon it, and is covered with a forest of holly, pine and chestnut trees, and underwood of various sorts, so thick that nothing is visible on either side. The road then for a mile and a quarter, to Jurol, was good and plain, upon the face of a right-hand hill, which has plenty of firs, holly, and yew upon its summit; and to the left, it is well cultivated towards a Khud which divides Koomarsaeen from Khunetoo. From Jurol to Thenoo, a distance of five furlongs, the road was good and even, lying on the western face of a range; and from thence, for three-quarters of a mile, not quite so good, and latterly rocky, through pines and holly, with some underwood, and still upon a right-hand range. The next five furlongs, to Burheree, was capital road, upon soil; and from thence to Kotgurh, a distance of one mile, a slight descent upon a right-hand Dhar covered with firs and yews. Reached at Camp at 3 P.M. Country for the first three miles covered with thick forest, latterly well cultivated on the left, towards the Khud; and likewise across it, is much cultivation, and many villages. All the hills to-day were com-

posed of micaceous slate, with some few pieces of quartz here and there. Saw the geranium and tansy; the latter in great abundance; and also several larch trees. Variation of compass 2° 4′ 42″ additive to the observed bearings.

September 5, 1817. Halted, and got equal altitudes of the sun, by which it appears that the chronometer has been going admirably well.

September 6, 1817. Tekree, 9m. 0f. Marched at 6 A.M. The first two miles to Sutlo consisted of slight ascents and descents, and was good, lying upon the face of a right-hand range, thickly covered with cheer and keloo trees. The next two miles and three quarters were tolerable, chiefly a descent, and sometimes rocky, skirting the same right-hand Dhar, which is here covered with oak forest; the Sutluj lying generally about a mile on the left. Then, for one mile and a half, to Burgaon; road for the most part good, and latterly a descent winding much and slanting through oaks, upon a right-hand slope. Then, for three-quarters of a mile the footpath was very rocky, slippery, and difficult, being a steep descent to the Bhereegarh, a stream a foot and a half deep, passing to the left: after crossing it, the road for one mile and a quarter to Delut, was a steep fatiguing ascent all the way, over immense rocks of micaceous schistus, which, by reflecting the sun, rendered the heat oppressive. Rest of the road, half a mile, pretty good, skirting a right-hand range to camp at Teekree, where I arrived at 12h. 30m. P.M. Near the road there was little cultivation; but the country across the Sutluj appears to be populous, the villages large,

and the crops luxuriant. The hills I passed over to-day were all composed of mica slate, sometimes bare, sometimes covered with extensive woods of oak and various sort of pine. The forts in Kooloo are in general situated upon the tops of very high precipitous hills, and appear to be difficult of access. Few of them, I believe, have guns; but a small garrison well supplied with stones, would make a good defence against any native power. The forts have five or six high towers upon the walls, which gives them a formidable appearance.

September 7, 1817.—Chuktee 7m. 0f. Thermometer at sunrise 65°. Set off from Tekree at 6 A.M. The first mile of the road was a slight ascent, bad, and over rocks to the village of Tootoo, which is pretty large. Then, for two miles to Punel it was tolerably even, but rocky in a few places, all the way from camp lying upon the face of a right-hand range, which is covered with pines. The next mile even, but sometimes rocky, winding upon a right-hand Dhar covered with fir and oak forest. Then, for a mile and a quarter, to Seeroo Ghat, the road was dangerous and slippery, often rocky, and freequently not half a foot broad, lying upon the slope of a right-hand range, which has some firs upon it. Here the footing was very unsafe, the path being overgrown with long grass, and not visible, so that the greatest caution was necessary to prevent a slip down a tremendous precipice on the left. After leaving the Ghat for one mile, the path lay over sharp pointed rocks, along the scarp of a left-hand hill, with a small rivulet below to the right, across which is the Must-

gurhee range, covered with different kinds of forest trees, and very high. From thence, for three quarters of a mile, there was good even road amongst cultivation to Chuktee, where I arrived at 11 A.M. The village is very confined and hot, being situated in a valley with lofty mountains surrounding it on every side. All the hills I saw to-day are composed of micaceous slate, and in many parts very rugged, but mostly covered with extensive forests of oak and fir. I passed but little cultivation on the march; here there is a good deal, the ground being plain, the soil rich and well supplied with water by numerous small rills.

September 8, 1817. Rampoor 12 m. 3f. Thermometer at sunrise 67°. Marched at 6 A. M. The road for half a mile was a descent to the Chukteegarh, the latter part rather steep and cut into steps. After crossing the stream, which was about one foot deep, the road for two miles was good, being a gradual acclivity upon a right-hand hill, sometimes swampy and through rice fields, of which there are a good many upon the banks of the Gadh. Then there was an ascent of a mile and three quarters, not steep, but rocky the whole way, with several flights of steps to the top of Oodhar Ghatee, from whence for half a mile the road was worse than any I have yet seen, being a descent at an angle of 35°, sometimes over irregular loose blocks of quartz, sometimes cut into short zigzags with a number of small stones in the way, which rendered it difficult to get firm footing. The next three quarters of a mile to the bed of the Sutluj was a more gradual descent, but still very rocky and dan-

gerous, upon the face of a right-hand hill. Then for two miles and a half the road was good and even along the left bank of the river, and through long grass with high perpendicular rocks of quartz on the right, and several extensive rice fields on each side of the Sutluj to the Nouguree, a large stream running over rocks with considerable violence. Crossed it by an excellent Sango, elevated forty or fifty feet above its bed. After leaving the Nudee the road was plain and good for one mile, and then the footpath for a mile and three quarters was rocky; first an ascent very gradual, and afterwards a similar descent upon the brow of a hill to the village of Phepree, situated about one hundred feet from the river. I arrived here at 1h. 30m. P. M. and found the heat so intolerable, the thermometer being 89° in the shade, that I halted until 4h. 30m. From this place had a fine view of the fort of Ramgurh in Kooloo, which is close across the river upon the summit of an almost inaccessible hill. It is very high, and the angle of elevation is 25° 50′, but from the bottom of the mountain it must be far greater. From Phepree the road for a mile and a half was rocky and lay near the Sutluj, elevated from two to four hundred feet above the stream; the greater part of the way over immense masses of micaceous slate and quartz, with many flights of steps both up and down, and a high range to the right. Reached Rampoor at 5 h. 30m. From Chuktee to where I first descended into the bed of the Sutluj, the hills were composed of micaceous slate, with small veins and angular pieces of quartz intermixed, giving the stone a marled appearance. From thence to Ram-

poor there was a greater proportion of quartz, and frequently large rocks consisted of it alone, and were scarcely distinguishable from white marble. Between Phepree and Rampoor, the stones upwards of 500 feet above the bed of the river appeared much water-worn, and shewed evident signs of having at one time been acted upon by a strong current: perhaps this was once the bed of the Sutluj, before it cut its way so far into the rock; or the water might have reached this height from the channel of the river being blocked up by an avalanch below. Such convulsions of nature sometimes happen. There was one instance of this kind at Sireenugar in 1802, at the time of the dreadful earthquake, and I understand about fifty years ago a similar occurrence took place near Soonee, when the Sutluj rose to an astonishing height. The hills I passed to-day were all covered with thick brushwood, except in the rugged places where the soil is washed away. The direction of the strata in the bed of the Sutluj near the Nouguree is N. 40° E. and S. 40° W. and at this place N. 84° W. and S. 84° E. dipping down to the river at an angle little inclined to the horizon. Across the Sutluj in Kooloo is a lofty chain of precipitous mountains, covered with kanta and kurenda bushes to the top, and accessible in only one or two places: the summit is studded with forts, which have each six or eight towers. The country to near Oodhar Ghatee is in general well cultivated, chiefly with rice, the ground being even and well supplied with water; from thence to Rampoor there is no cultivation except near the river, the rocks on each side being too

rugged to admit of any. The Sutluj varies considerably in breadth and appearance. In one place it is confined within a narrow channel, having perpendicular rocks on each side, the stream rushing over large stones with immense velocity and a noise like thunder. In other parts the bed expands to 500 feet, and the current is gentle, running over sand and small pebbles.

September 9, 1817. Thermometer at sunrise 75°. Went to Odagurhee in order to observe some of the distant peaks; the distance from Rampoor is about a mile and a half, and the road a steep and fatiguing ascent the whole way, lying over misshapen rocks, and through very thick brushwood. The fort is a small place constructed of stones piled upon one another without cement, and could be knocked in pieces with a couple of six pounders in a few hours. The day was so very unfavourable from clouds hanging upon the surrounding hills, that after staying upwards of three hours I could not get a sight of either Hutoo, or Mustgurh, which are both said to be visible in clear weather, and it was the greatest luck that I got a glimpse of the forts in Kooloo. I returned to Rampoor at noon. This town, which is the capital of Busehur, is a poor-looking place, consisting of about one hundred houses, and situated upon the left bank of the Sutroodra or Sutluj. It contains seven or eight shops, but few articles of any kind are to be got; neither shawls, Putoo, nor Chowries are procurable; blankets are scarce and of a bad kind: I could only get three. From the small size of the valley which the town occupies, and the ruggedness of the moun-

tains in the vicinity, it could scarcely ever have been larger, but I understand it carried on a much better trade before the Goorka invasion than it does at present. The houses are generally large, well built of stone, and slated like those of most villages in this part of the country. The slates are large, of a brownish colour, very thick, and form heavy roofs; those upon a few of the houses are cut oblong and laid on regularly, which has a neat appearance, but by far the greater number are all manner of shapes and sizes, piled upon one another with the utmost confusion and disorder. The heat here is very great, the thermometer to-day at noon being 92° in a capital shade, and in June it is much higher. This arises from the low and confined situation of the town, all the surrounding hills being high, with large quantities of bare rock, attract and retain heat a long time. There is a fair here in January, and another in October. Under the Rajah's palace, which is at the northern angle of the town, there is a Jhoola or rope-bridge across the Sutluj which leads to Kooloo. The Jhoolas are generally constructed as follows:—Two or three strong posts are driven into the ground near the edge of the water; a fir tree is laid cross-ways, and above it is a stone pier six or eight feet high, at the top of which is another cross fir; the same is done on the opposite side of the river: then five or six strong ropes of hemp are laid from bank to bank over the upper trees and tied to the lower ones, which sustain almost the whole force, and are prevented from slipping by the perpendicular stakes and piers; half a fir hallowed out, and about two feet long, is placed

upon the hemp ropes with the hollow downwards, and through it below are two cross sticks which project horizontally on each side six or eight inches; these not only prevent the hollowed fir from falling off, but serve to hold by; to this piece of wood is attached a loop of three or four ropes which hangs down, and in it the person who wishes to cross takes his seat, holding by the cross sticks. A rope is fastened to each end of the above mentioned piece of wood, the people on one side of the river pulling, whilst those on the other give out rope. The Sutluj under the Jhoola is 211 feet by measurement. The Jhoola is elevated about thirty-five feet above the stream, and in the rainy season the water frequently comes within four feet of it; I crossed over to Kooloo and found the conveyance not at all unpleasant. It is rather alarming to a person unaccustomed to it, as the river runs with great rapidity and a thundering noise. Persons subject to giddiness are tied in, in case they should let go their hold. In November the river is crossed here upon inflated skins as at Bilaspoor, but at present it is far too high to attempt it.

September 10, 1817. Dhar, 7m. 7f. Thermometer at sunrise 77°. Left Rampoor at 6 A.M. The road for the first two miles was indifferent and rocky, elevated about 200 or 300 feet above the river, which lay close upon the left. The next mile was tolerably level, sometimes rocky but oftener swampy, and a gentle acclivity; then for one mile the road was bad, frequently steep, and over detached fragments of quartz. The next mile was a

slight ascent over rocks, and through scattered fir-trees. Then, for a mile and a quarter, the footpath consisted of ascents and descents, often difficult and rocky, over large masses of quartz and micaceous slate, with many flights of steps. From thence there was a very steep ascent, the road being difficult, dangerous, and excessively slippery, upon pure mica, glittering much. Here I was obliged to make use of my hands to catch hold of the projecting rocks which overhung the path. This part appears to have given way only a few days ago, there being scarcely the trace of a foot-path. Then, for half a mile the road was good and even, upon soil and through cultivated fields to Goura, from whence there was an ascent of three quarters of a mile, rocky and often steep to camp at Dhar, which I reached at 12h. 15m. P.M. Goura contains about fifteen houses; and I should suppose it to be 3,000 feet above Rampoor. The thermometer at noon 77°. The road the whole way lay upon the face of a right-hand range, composed of micaceous slate and quartz, and covered with brush-wood, and here and there a few firs: the Sutluj lay from a mile to a mile and a quarter on the left. The range across the river is generally rugged and barren. There is some brushwood upon it; and near Dango and Bookso a quantity of large pines. The country to-day was well cultivated near the villages; and I passed some large fields by the road side.

September 11, 1817. Soorahun, 9m. 1f. Thermometer at sunrise 66°: cloudy. There was a good deal of rain this morning, which prevented me

from moving until 7h. 40m. A.M. The first mile and a half was an entire swamp, through rice fields. Then, for one mile and three quarters it was good and even, lying upon a right-hand range, and mostly through oak and Keloo trees with a few chestnuts interspersed. The next mile and a quarter was an indifferent descent over rocks, with several flights of steps winding upon the face of a Dhar which lies to the right, and is covered with oaks to Mujeoulee.

Then there was a steep and difficult descent of three quarters of a mile, extremely rugged and rocky, to the Munglad Nudee, a torrent which derives its source from melted snow. Crossed the stream by a Sango, elevated about ten feet above the water. It consists of two fir-trees about a foot apart, with small twigs laid across in bundles: one of them is much lower than the other, and the utmost care is requisite to avoid slipping off into the stream, which is of considerable size, and rushes down in torrents, foaming and roaring and dashing over immense blocks of stone, which lie in its bed. After crossing the Munglad, the road, for a mile and a quarter, ascended over detached pieces of micaceous slate, sometimes overhanging the path; the whole way exceedingly difficult and dangerous, and rendered extremely fatiguing by the reflection of a burning sun from the mica. For the next two miles and a half to camp, the footpath was level but rocky, upon the face of a right-hand hill. Reached Soorahun at 3h. 30m. P.M. Soorahun is situated upon the banks of a small rivulet which runs through it, and contains about twenty-five houses. It is the residence of the Rajah of Busehur for

about six months in the year. He comes here in April to avoid the great heats at Rampoor, and returns in October. The hills I passed to-day, are all composed of micaceous slate, and mostly covered with dark forests of oak, with some underwood, and the ground is frequently overspread with the wild strawberry. Across the Sutluj, which lay at the distance of a mile or a mile and a half from the road, there are only five or six villages, with little cultivation around them; the hills being abrupt, rugged, and high, with brushwood here and there. On this side of the river, the country is well cultivated near the villages, which are numerous: there is a Jhoola here across the Sutluj, which is about two miles distant, and near 5,000 feet below. From a little S.W. of the Nouguree, which has its source amongst snow, to this place, the Sutluj runs between two ranges of the Himalaya. The villages are situated a short distance from its bank, and I believe I have got the approximate positions of almost every one. From Rampoor to this the hills on the right are very high; I suppose not less than 8,000 feet. Hereabouts a watermill generally belongs to several villages, and is situated upon the bank of the nearest rivulet.

September 12, 1817. Chora, 8m. 3.5f. Thermometer at sunrise 64°. Marched from Soorahun at 6, A.M. The road for the first mile was good and even upon soil; then for a mile and a half it was rocky and indifferent, the latter half being an ascent with steps in many places. The next mile and a quarter was a rocky and difficult descent through thick forest to the Kootulgarh, a rapid stream one

foot deep, after crossing which the road was bad and difficult for three quarters of a mile, sometimes winding round stupendous rocks with cavities scarcely large enough for half the foot; whilst on the left there was a frightful precipice. Then there was half a mile of bad road, consisting of steep ascents and descents over rocks to the Simdarung, a large torrent passing with much rapidity to the left. After leaving it, the road for a quarter of a mile was a steep and rugged ascent, and then it was tolerably even for three quarters of a mile, but still rocky. The next half a mile was a very difficult and steep descent to the Kandloo Nudee, a stream of some size, which was crossed by a Sango, and the rest, a distance of a mile and three quarters, was still a descent over crumbling rocks to Camp at Chora, where I arrived at 1h. 30m. P.M. The road to-day lay upon the brow of a right-hand range, in general covered with oak, Boorans, and other trees, which has very little cultivation upon it; the Sutluj lying from one to two miles on the left. The rocks are extremely rugged and consist of micaceous slate. Across the Sutluj the mountains are more precipitous, in a few parts clothed with low Jungul, but mostly bare. All the large streams I crossed to-day have their sources amongst snow: their descents are steep, and they rush with tremendous violence and astonishing noise over immense masses of rock forming a succession of rapids. Up the beds of some of them I saw extensive forests of various sorts of pine, beyond which are woods of birch extending to the Himalaya, said to be six or eight coss distant. Chora is a village of ten or

fifteen houses, situated about half a mile from the Sutluj, in the Koonawur district.

September 13, 1817. Turenda, 4m. 2f. Thermometer at sunrise 66°. Marched at 6, A.M. The first half a mile was a steep and rocky ascent. The next five furlongs, a more gradual acclivity, but attended with much danger, frequently upon the face of a bare rock inclined at an angle of 20°, and without any cavity for the foot. Here the utmost caution was necessary, there being a frightful precipice on the left, and I was often obliged to crawl upon my hands and feet at a very slow pace. The footpath then consisted of ascents and descents over rugged rocks for a mile, and lay upon the brow of a right-hand hill, covered with oak and Boorans, upon some of which I saw the mistletoe. The next three quarters of a mile was a descent of pretty good road to the Chounde Khud, a rapid torrent, which has its source in the snowy range and tumbles down over unconnected rocks with impetuous force. Here crossed it by a good Sango, and proceeded for one mile up a steep and difficult hill covered with large Keloos to a Debee, from whence there was a gradual descent of a quarter of a mile to camp at Turenda, which I reached at 11h. 30m. A.M. The road lay upon a right-hand range the whole way, which to the Chounde was covered with oak and Boorans, and from thence to camp with tall Keloos. The Sutluj was distant generally from half to three quarters of a mile on the left. Where the rocks have been laid bare in the beds of watercourses, they approach very near to granite and may be reckoned an imperfect kind of it. The

quartz and mica are distinctly visible, but the third component part, felspar, is wanting. The hills are all rugged, the cultivation scanty, and the villages thinly scattered. From a few miles N. E. of Soorahan to this place the houses are covered with Keloo planks, because the stone as it comes nearer to granite grows gradually more solid and hard, and is not capable of being cut into slates. The actual distance marched to day may be near half a mile more than what is put down, for the perambulator being in a crazy condition, I told the man to lift it over the difficult places. Variation per azimuth 2° 52′ to be added. Turenda is a village of twenty-five or thirty houses. Thermometer at noon 71°.

September 14, 1817. Nachar, 8m. 1f. Thermometer at sunrise 62°. Marched from Turenda at 6, A. M. The first half a mile was good and even to the Manteerung Gadh, a rapid torrent one foot deep. After crossing it, the road for three quarters of a mile was tolerably plain, but frequently rocky, upon the face of a right-hand hill covered with yew trees, the Sutluj lying a mile to the left. The next mile was a steep and tiresome rocky descent, and then for half a mile it was pretty level, but still rocky, and crossed by two branches of the Syldung, whose banks are lined with chestnuts; both the streams are large and descend from the Himalaya, through pine forests, with astonishing rapidity, forming many beautiful cascades, and breaking against the numerous insulated rocks which lie scattered in their beds, with a noise like thunder. After crossing the Syldung by two good Sangos, the footpath for one mile and a half was

chiefly an ascent over rocks and through a forest of oak and Bqorans. The next mile and a half was excellent and broad road through lofty Kelmung trees, several of which measured from twenty to twenty-seven feet in circumference. The Kelmung, I believe, is the same as the Keloo. The latter two miles was a good road, being a very slight descent upon a right-hand range, at first covered with oaks and afterwards with pines, and intersected by numerous small rivulets to camp at Nachar, where I arrived at 12h. 30m. P. M. The hills to day are generally between gneiss and micaceous slate, the former having all the ingredients of granite, but being of a more slatey appearance. Below they are covered either with oak, yew, or firs, and above nothing but pines are to be seen. The mountains across the Sutluj for the first six miles have a barren and craggy appearance, are unwooded, and in many places entirely destitute of vegetation. In the last two miles their summits are covered with pines. The few villages which occurred in to-day's route, consisted generally of a single house, and are the summer habitations of the shepherds, who reside there with their flocks for four or five months in the year. The soil is rich and well adapted for agriculture, but the narrow stripes of cultivation are very thinly scattered. In the environs of Nachar there are a good many cultivated fields, and some grapes, which at this height seldom ripen. Nachar is a village of twenty-five or thirty houses, roofed with shingles of the Keloo. Thermometer at 1h. P. M. 76°.

September 15, 1817. North bank of Sutluj 5m. 5f.

Thermometer at sunrise 62°. Left Nachar at 9 A. M. The first mile and a quarter was good, and then there was a rocky and difficult descent of one mile and three quarters to Wangtoo. The range lay upon the right, and was covered below with underwood, and above it with oak and pine forest. Here are the remains of a good Sango, elevated about forty feet above the stream. It was destroyed at the time of the Goorka invasion, when great part of the population of Busehur fled across the Sutluj to Koonawur and Kooloo. A good Sango is constructed as follows:—A rock almost perpendicular and high above the stream, is selected on each side of the river; then seven or eight stout fir trees are laid upon it horizontally, in general pointing a little upwards and projecting ten or fifteen feet over the stream: above these are two other rows of trees, each, one less in number, and projecting beyond the one immediately below it. The ends of the trees extend twenty or thirty feet upon the rock, and above them is raised a solid stone building. The space being thus diminished in breadth, three or four fir trees are laid across, on the top of which are planks, and on each side a railing. A little below the Sango is a Jhoola, elevated about twenty feet above the iver, which is here eighty-eight feet broad. On the left side it is low and fixed close to the water's edge, but on the right bank it is fastened at some distance, the rocks being high and sloping down at an angle of 25°. The landing place on the northern bank of the river is very slippery, and attended with much danger. The river here is muddy and confined between huge

rocks of granite, which are smooth from the action of water. The stream is considerably contracted in breadth, but not much less in size than at Rampoor, it being joined by no very large torrents except the Nouguree and Syldung. In some parts it is upwards of 110 feet broad, and in others not fifty feet. The current descends at an angle of 27′. which gives a fall of forty-one feet in a mile, and it runs with a velocity of not less than eight miles per hour. On the left bank of the river, and separated from it by a rock, is a hollow, much water worn, in which a stream of the Sutluj appears to have run at a former period; it has been blocked up by the fall of an avalanche from the mountains above. The rocks here are entirely bare, and inclined to the horizon at an angle of 20°, dipping down the stream, but the stratifications are not discernable. Veins of a whitish colour intersect the granite in different directions, branching out like trees, and there are several of black micaceous slate. Found the heat exceedingly great, owing to the reflection of the sun from the naked rocks. The thermometer being 82° under the shade of a high mountain. At this place saw a great many lizards of a very large size, and frightful black colour. Three furlongs from this crossed a rapid Khud by a Sango of a single fir spar one foot broad, thrown across from rock to rock at a considerable elevation above the bed. The proper distance from Nachar to Wangtoo is 3m. 4f. Arrived at Wangtoo at 11 A. M., and much difficulty and delay occurred in transporting the baggage, from the ropes which pull across the seat continually breaking.

Every thing, however, was got over without an accident, and at 4h. 30m. P. M. we left Wangtoo and proceeded along the face of a left-hand range for three furlongs to the Bhabe or Wangpo Khud; the road at first was difficult and rugged, but latterly good. After crossing the Khud by a capital Sango three feet broad, consisting of two fir trees with planks nailed upon them, the road for three furlongs was a tiresome and difficult steep ascent over rough sharp pointed rocks to the top of a ridge, where there are a good many fir trees. Upon gaining the summit, had a beautiful view of the Wangpo Gadh; grand beyond description. It is a large torrent which has its source amongst snow, and rushes down a steep mountain, at an angle of not less than 30°, forming many waterfalls in its course, roaring with a noise heard at a considerable distance, and dashing against the huge masses of rock in its bed, the spray and foam rising in showers to an extraordinary height. I stayed until near sunset contemplating this scene of grandeur, not knowing that I had yet far to travel. Leaving the top of the ridge, the road descended obliquely for one mile and a half upon a left-hand range, covered with pines above, and below with bushes. It was extremely dangerous, lying first upon a rocky ledge, with a dreadful precipice on the right, and afterwards over the irregular fragments of an avalanche, and what rendered it far more difficult, was being obliged to travel it in the dark. The last half a mile to camp was good and even, upon the right bank of the Sutluj. Arrived at 8 P. M. being guided

for the last mile and a quarter entirely by the flash and report of muskets which Govan fired frequently to apprise me of the direction of the camp. All the baggage came up in safety about 11 P. M. During the last three days the flies have tormented us much. They are of a small size, and very numerous and annoying, frequently going into the ears, nose, and mouth.

September 16, 1817. Chegaon, 4m. Thermometer at sunrise 66°. Marched at 6h. 30m. A.M. The road, for the first three quarters of a mile, lay along the right bank of the Sutluj, and consisted of rocky ascents and descents. I took the depression of the river in two places, viz. 1° and 1° 30′, the latter angle gives a fall of 138 feet in a mile, and in some few places it appears to descend at the rate of above 400 feet. The next mile was in general pretty good, and then there was half a mile of rocky bad road, after which the footpath, for a mile, was a difficult and steep ascent over abrupt and rugged rocks to an arch composed of two stupendous rocks of granite, which meet at the top, forming an angle. The next three quarters of a mile was first an easy descent to a stream, from which there was a difficult steep ascent to Camp at Chegaon, where I arrived at 11 A.M. The road to-day lay upon a left-hand range, which, near its base, is rugged and craggy, with scarcely any vegetation upon it, but further up produces a few pines. The Sutluj, for the first two miles, lay almost close on the right; afterwards the pathway receded gradually from it as it ascended to Chegaon, from which place it is distant about five furlongs. The hills across the river, for the

first mile, from last camp, are barren until about half way up, from whence to the summits they are clothed with firs, but latterly they are completely covered with extensive forests of pine. Chegaon is a large village, in two divisions, each of which contains fifteen or twenty houses. One part is situated to the westward of a stream, and the other, where I encamped, is opposite to it, about three furlongs distant, and watered by a small rivulet which runs through it. The rocks are generally composed of micaceous slate, and in the last two miles and a half there is a great proportion of quartz and granite. There are several large cultivated spaces around Chegaon, and many fields to the north far up the hill. There is also a good deal of cultivation near villages across the river. The mountains are not above three miles distant on either side. Across the Sutluj, they are steepest on the N.W. face, by which it would appear that they dip to the south-eastward. From Wangtoo to this, the road in some places is so bad as to be scarcely practicable for any animal, except a goat or a monkey. In a few places, the stones, which project hardly two inches from a perpendicular rock, form the only resting places for the foot, whilst on the other side is a steep precipice. From Wangtoo to Chegaon the correct distance is 6m. 7.5f.

September 17, 1817. Meeroo, 5m. 1.5f. Thermometer at sunrise 58°. Left Chegaon at 8 A.M. The first mile and three quarters was a slight ascent, frequently rocky, and in general through brushwood. For the next mile the road was excellent, lying upon soil, and through thick holly forest.

Then, for half a mile the footpath was good to Oornee, with the exception of two rocky spaces, each about 100 yards in length. From Oornee there was a whole mile of difficult and tiresome road, in general slippery, and a steep descent over abrupt rocks, upon which the holly trees are thinly scattered the first half of the way, and latterly the soil is too scanty to produce any thing but a few bushes. The guide took me by the wrong road, and the last furlong was exceedingly dangerous, lying down the face of several smooth rocks inclined at a great angle. Here, crossed the Meeroo Gadh by a good Sango. It is a rapid torrent of some size, which springs from the snow, and rushes down a steep slope with extreme violence, making a thundering noise upon the larger masses of rock in its channel. From the Gadh to camp, a distance of nearly a mile, the ascent was fatiguing and tedious. The first and greatest part of the way very steep, difficult, and stony, and through holly forest; afterwards the acclivity was more regular and gradual, through scattered holly trees. At noon reached Meeroo, a village of twenty or twenty-five houses, pleasantly situated and skirted by a rivulet. The pathway to-day lay upon the face of a left-hand range, often rugged, and composed generally of gneiss, between black micaceous slate and granite, for the most part covered with two kinds of holly, Burch and Broo. In some places the trees were very close, and in others thinly scattered. The range, across the river, presented nothing but vast forests of pine, which reached to the very top. Much birch grows five or six coss to the northward, and the bark of it is

used hereabouts in the roofs of houses, above which they put earth. The temples of the Deotas (deities) are almost all roofed with fir planks. The hills likewise produce a new species of pine called Ree, that bears the Neosa nut, which in shape and taste very much resembles the Pestur or pistachio. The snow at one place on the road was only about three quarters or one mile to the left, and across the river it lay in the ravines, from a mile and a half to two miles distant. It extends considerably further down on the northern face of the mountains than it does on the southern side. From the angles observed to-day, I make the lowest part of it across the Sutluj about 1250 feet above Meeroo, and to the north 950 feet higher. This, however, can only be a very indifferent approximation as the distances were estimated. There is a large quantity of arable land about Meeroo, Oornee, Kheelwa, and Yoola, but the crops are very poor, the ear small, and not above half filled. In the vicinity of the villages are many pears, peaches, and apricots, the latter of a delicious flavour. The Sutluj, which lay from half a mile to a mile on the right, is here much increased in breadth, the current flowing gently over a bed of sand and small pebbles. The Himalaya, which were distant three and a half or four miles on the right, exhibited a majestic appearance; their lofty sharp-pointed summits rising in a variety of fantastic forms and shapes. In the evening visited a Chostin or temple, built by the Lamas situated about half a mile N.E. of camp. The road to it was a steep and rugged ascent, upon a hill covered with fern and wild thyme, with which the

country here abounds. Was much delighted at seeing a variety of most beautiful shrubs: the larkspur and white pink were in great plenty, likewise the ask, wild onion, and a barberry of an agreeable acid; and a number of other plants whose names I do not know. Bearings, from the Lamas' temple, Chalgee 195°, Meeroo 224°, Oornee 243°, Yoolpa 313°. Elevation of the nearest snow across the river, 3° 5′. At this place I first saw the Sooragaee, called in the Koonawuree language Yag. It is about the size of a large ox, with small ears and long horns curved inwards, the forehead and hump are covered with thick curly wool, and upon the rest of the body the hair is long: the tail, from which Chowries are made, is bunchy and sometimes two and a half feet in length. They are strong and hardy animals, but frequently very vicious and unmanageable. A single one put the whole of the villagers to flight, the people taking refuge on the tops of houses. The Zemindars pointed out a hill above Yana or Zhanee, where the last battle was fought between the inhabitants of Busehur and Goorkalees; the former, under Teekumdass, encountered the advanced guard of the latter, and came off victorious, after which they retreated across the Sutluj, and destroyed the Sango at Powaree, in order to prevent the main body of the Goorkas, which was advancing, from following them. The Ata here is much dearer than it was yesterday. At Meeroo it was eighty K. Ser, or sixteen Butees for the rupee, and to-day only ten. The Zemindars said snow fell so early last season, that they were obliged to reap their harvest when

quite green. They brought me some wheat in sheaf, which certainly was the poorest specimen in the shape of grain that ever I saw, the ears being not half full, and quite dried up. I thought my people were very lucky in getting any thing at all to eat, and of course would not interfere. Afterwards the Matas, or head person of the village, who is a very respectable-looking man, settled the price at twelve Butees. During last night much snow fell upon the mountains to the south; and the people say, in two days more the pass to Choara will be impracticable. I, however, resolved to proceed three marches further, and on my return attempt to cross the Himalaya; but Govan was of a different opinion, so here we separated. The limit of perpetual snow across the river elevated 5° 43′, and distant three miles. On this side, the elevation of the nearest snow is 15° 10′, and about two miles and a quarter from Meeroo. Thermometer at noon, 75°.

September 18, 1817. Rogee, 8m. 3.5f. Thermometer at sunrise 55°. Marched at 6 A.M. The road, for the first mile and a half, was usually good, and consisted of ascents and descents through underwood and Kelmung trees. The next half a mile was shocking beyond description, the path being extremely narrow and bordering upon a precipice. Here, for a moment, the eye could not be turned off the road without the most imminent danger, and it was likewise necessary to keep a good look out above, for the impending rocks overhung the pathway so much that the traveller was frequently obliged to stoop in order to avoid being

knocked down by them. The road then was ascents and descents upon rugged stones through thinly scattered Ree and Kelmung trees. The next half a mile was, for the most part, difficult and rocky, being unequal ascents and descents and crossing two branches of the Roongur Khud, both shallow. After leaving the Gadh, there was a tiresome, but not very steep, ascent of three quarters of a mile, upon a hill covered with Leem forest. Then, for a mile, it was an easy acclivity amongst Kelmung trees. The next three quarters of a mile was difficult and dangerous; road much the same as what I met with near the beginning of the march, and the last mile and a quarter ascended and descended, sometimes over rocks, to Camp at Rogee, where I arrived at 1 P.M. The pathway to-day lay along the brow of a left-hand range partly covered with different kinds of pine and partly barren. The hills, for the first mile and three quarters, were composed solely of micaceous slate, inclined to the horizon at an angle of 20°, and dipping to the northward; latterly many sharp angular pieces of quartz and some gneiss were intermixed. To the left, the rocks in general rise at a very abrupt elevation, often perpendicular, and projecting far over the road: they were destitute of vegetation, cracked in every direction, and seemed ready to fall down on the slightest touch: further down towards the river, there are many pines, except where they have been broken down or buried in the fragments of avalanches. The Sutluj, which in the Koonawur language is called Sumudrung, or, the river, is formed by two branches; the smallest, which is

named Buspagarh, comes from the S. E. and is about a quarter the size of the other; between the two streams is the Ruldung or Kylas range, which is wholly covered with snow, and consists of an assemblage of sharp peaks rising to a majestic height in a variety of shapes. The other branch of the Sutluj, which still retains the name of Sumudrung, comes from the eastward, and lay from half a mile to a mile on the right of the road. Across it is a high chain of mountains, clothed with many varieties of fir to the summit, with the exception of a few bare patches which present to view the marks of the descent of avalanches, and have much the same disjointed and rugged appearance as the hill on this side. Some of the avalanches must have been but recently precipitated from above. A shower of rain would certainly bring down many more, and probably destroy part of the road from Meeroo to Rogee. To day I did not see a single village or cultivated spot near the road-side, except a solitary hut, situated at some distance, around which were a few fields. There is little tilled land near this, or even in sight, but across the river there appears to be a good deal about the villages. The mountains, distant from three to four miles, produce many kinds of pine, some of which are as follow: Leem, Krog, Kelmung or Keoulee, Geosun, and Manderung; the summits, which are unwooded, have been newly covered with snow, and display a dreary and desolate prospect. Rogee is a village of about twenty houses. Close to camp is a rivulet.

September 19, 1817. Pangee 9m. 0.5f. Thermometer at sunrise 56°.5. For the first mile and a

half the road was tolerable, and an ascent; the next two furlongs a steep ascent, the footpath made with great difficulty and labour: most part of the way rude steps of wood and stones, with here and there Bulees driven horizontally into the clefts of perpendicular faces of rocks, and the other ends resting upon posts or trees, and above an unsteady scaffolding of boards, shaking under the feet, which seems to require but little to bring it down; then for four furlongs the road was good, but a steep descent to the Kosharung Nudee, from which there was a very steep ascent of 200 yards, up flights of steps and upon scaffolding; the next quarter of a mile was a more moderate acclivity. The road then was broad and excellent upon soil for five miles, and winding through a beautiful thick wood of lofty Kelmung trees, after which was a very steep descent of half a mile to the Kozhang, a considerable mountain torrent descending from the Himalaya on the north with violence. Crossed it by two Sangos, and then had a very fatiguing and steep ascent of one mile and a quarter to Pangee, which I reached at 2 P. M. after a march of eight hours. The hills are almost wholly composed of mica slate, with here and there pieces of quartz, gneiss, and granite. The direction of the strata is from N. 48° W. to S. 48° E. and dips to the north eastward of an angle of 15° or 20°. For the first part of the way much bare rock is seen, abrupt and craggy, and rent in every direction; at the top further down there is a gentle slope with much soil about Kotee and Cheenee highly cultivated, otherwise covered with Kelmung and Ree to within half or three

quarters of a mile of the Sutluj, where it again gets steep and abrupt. There are many vineyards belonging to Cheenee, and the villages in the vicinity, and numerous peaches and apricots are met with; the latter of a delicious flavour. At Pangee there is a fine crop of apples very large and well tasted, at present they are not quite ripe, but make excellent dumplings. The mountains across the Sutluj appear to be composed of the same kind of rock as those on this side. There is scarcely any cultivation upon them, the whole being thickly covered with various sorts of pines. The Kylas or Rulding Peaks, seven or eight miles distant, and about 20,000 feet in height, are entirely clothed with snow on their tops. To-day I saw a large part of one of them tumble with a noise like distant thunder. At Pangee there are two Lamas' temples called Chostin, resembling the one at Meeroo. The Chostin consists of a small house entirely covered; one end is open opposite to which it is shut, and the two sides are half built up. In it, near the back part, is a small earthern figure, in the shape of an urn, white-washed. The Deotas' Kothees here are studded on one face outside with deers' horns in pairs. The houses here are flat-roofed and in general well-built. The roofs are of earth, about half a foot deep, beneath which is a thick layer of birch bark an excellent defence against water. The crops are half dried up and have a very shrivelled appearance. Pangee is a large village in three divisions, containing about forty houses.

September 20, 1817. Rarung 7m. 3.5f. Thermometer at sunrise 57°. Road for the first mile

and a half generally good, through Ree and Kelmung, with scaffolding in a few parts. Spars are thrown from rock to rock, and above them are boards. Where this was impracticable on account of the distance, the beams rest upon trees or posts, and Bulees are driven into the fissures of perpendicular faces of rock with their other ends supported. Now and then you meet with a rude flight of steps of wood and stone. The next mile and a quarter is a steep descent to the Kashung Nuddee. Cross it by a Sango of five small fir trees, which appear to be all rotten; the stream descends rapidly from the snow on the left, and is often interrupted by large fragments of rock. Above, on the right bank of the Nudee, is Kashung Dongree, belonging to Pangee, where there are a few fields. Hence there is generally an ascent for one mile, then there is a mile of indifferent road, and the rest is interrupted by fragments of a granite avalanche, and very bad. Marched at 6h. 30m. A. M. and arrived at Rarung at 1h. 15m. P. M. The hills near this have a good many pines upon them. Across the Sutluj they have much soil, and are clothed with dark forests of fir. The Kylas mountains have much snow upon them, and seem very high. There are but few fields here, the cultivation being much scattered in narrow strips. The crops do not attain anything like perfection, and the wheat Ata is here 16 P. Ser. per rupee. Rarung is a village of about twenty houses. The mica slate near this dips to the N. E. making an angle of 10° or 15° with the horizon.

September 21, 1817. Halted to observe equal altitudes of the sun.

September 22, 1817. Pangee. Thermometer at sunrise 56°. Marched to Pangee, distant 7m. 3.5f. Was four hours on the road. There having been many clouds for the last three days, the villagers performed a ceremony to drive them away. They assembled before the Deotas' temple, and made a loud noise with drums and trumpets.

September 23, 1817. Rogee. Thermometer at sunrise 49°. Marched to Rogee, distant nine miles. Was four hours and a half on the march. During last night a great quantity of snow fell upon the adjacent hills.

September 24, 1817. Meeroo. Thermometer at sunrise 52°. Marched to Meroo, distant 8m. 3f. March occupied four hours and a quarter.

September 25, 1817. Camp 7m. 6f. Thermometer at sunrise 52°. Was two hours and three quarters on the road to Chegaon, where I arrived at 9h. 15m. A. M. Breakfasted here and stopped till 3 P. M. Then proceeded to the right bank of the Sutluj, and encamped in a cavity in the rocks close to the river.

September 26, 1817. Panooee 5m. 4f. Thermometer at sunrise 53°. Marched at 7 A. M. and reached Wangtoo 4m. 3.5f. at 9 A. M. Breakfasted and waited for equal altitudes, then set off for Panooee at 2 P. M. Two of my people foolishly attempted to swim across the Sutluj; they jumped off the bank above the Jhoola, where the river did not seem sixty feet broad, and were carried down at a prodigious rate; they were both reckoned capital swimmers, and one managed to land about a quarter of a mile below Wangtoo, so completely ex-

hausted as to be unable to move for some time: the other got on very well till about the middle of the stream, where his strength failed him; I saw him with the telescope distinctly sink seven or eight times and rise again, and at last he disappeared to rise no more, when nearly a mile distant. I sent several people down both banks of the river to see if they could render any assistance, but the road was so rocky that they could not walk so fast as the velocity of the stream, which ran about seven miles per hour. Three furlongs; the road rocky, in general an ascent upon a left-hand hill, latterly with a Khud on the right. Six furlongs and a half: road pretty good, an ascent through Kelmung trees: Dhokto one house, a furlong on the left. Seven furlongs: road level and good, upon a right-hand hill, with a Khud some distance on the left to Panooee or Panung, a village of six or seven houses. I arrived at Panooee about 4 P. M.

September 27, 1817. Camp, 5m. 4.5f. Thermometer at sunrise 55°. Six furlongs and a half: a very steep and fatiguing ascent through Leem, Ryung and Spun trees, varieties of the pine: five furlongs, ascending steeply through pine forest. Here first saw the birch. One furlong: road good but very steep; ascent through birch, Spun, and Teelun or maple trees. Four and a half furlongs: road tolerable, but a rocky ascent upon a right-hand hill, with the Skoolung Gadh lying on the left. Hills here covered with Khursoo or holly, Leem, and Spun, and some birch, and a great many black currants, the fruit now ripe. There is also hemlock

and rhubarb, the latter known to the Goorkas as a medicine. One furlong: road generally a rocky descent to the Skoolung Nudee, a fine stream running to the northward. This is a most beautiful sequestered glen, abounding with beds of wild strawberries, very few of which ripen. Two furlongs: cross the Gadh, and leave it to the right, ascend steeply through Spun, mountain-ash, and other trees. The black-currant, Docken, and Sooruk, in plenty. Roddens well tasted and large, but not ripe. Two furlongs and a half: a very steep and rocky ascent, through Spun, birch, and Rodden. Four furlongs: road tolerably even upon turf. Six furlongs: road in general good, some few rocky descents excepted, lying upon the face of a right-hand range, covered with strawberries and a great variety of European plants, soil a black vegetable mould, and very rich. The rocks are of gneiss, with much felspar. The Shatool Tee lies on the left, about half a mile distant, and across it is a range clothed with Spun, holly, and birch. Five furlongs: road capital, upon turf, and through a profusion of Alpine shrubs. Six furlongs: road in general good, but now and then rocky, upon the face of a right-hand hill, with the Shatool a quarter of a mile on the left. A quarter of a mile from this, crossed two small rills fifty yards apart, and a little further another, 100 yards up which, is a recess in the rock capable of containing six or eight people, where travellers frequently halt. One furlong: footpath tolerable, ascending with the stream, 200 yards on the left, to camp. There are several patches of snow in the bed of the Shatool, close to

camp, and on each side of it are a few dwarf birch and Spun, growing singly: further up is grass, and the tops of the mountains are bare rocks. The bark of the birch is the Bhojputtur used for Hooka snakes, and is of a light grey colour with small brown specks: it peels off the trees, which have a ragged appearance. To-day's march was very fatiguing, but the enchanting scenery with which it abounds rendered it pleasing. The road exhibited great variety; at one time leading through evergreen forests of pine, at another upon turf diversified with a luxuriant profusion of beautiful wild shrubs, whilst the light foliage of the birch, appearing intermingled with the dark verdure of the holly, formed a striking contrast. Left Panooee at 7 A.M., and reached camp at 3 P.M. It began to rain immediately on my arrival, and neither warm clothes nor tent came up till sunset, and my bed was wet through. Found a wonderful change in the climate in so short a distance, the thermometer being above 20° lower than yesterday. An unboiled barometer tube of twenty-one and a half inches, stood at 19.67, which indicates an elevation of about 12,000 feet, so I reckon the ascent to-day at 5,500 feet of perpendicular height. It continued raining till 8 P.M., and the Panooee people said, if any fell during the night the pass would probably be shut up with snow.

September 28, 1817. Camp, 11m. 0.5f. Thermometer at sunrise 27°.5. Five furlongs and a half: road good, upon a right-hand unwooded grassy range, with patches of old snow in the Shatool on the left. Five furlongs: crossed two rills by arches of snow quite hard; road ascents and descents

upon a right-hand hill. Five furlongs and a half: footpath similar, upon a rich black soil producing grass, and a variety of European plants, the Shatool lying fifty yards on the left. Crossed three streams on the way, and passed a grotto on the right, capable of holding several people: the rocks here are mostly all of felspar. Four furlongs and a half: road much the same, close on the left bank of the Shatool. Crossed three streams on the way: snow in patches. Two furlongs and a half: road sometimes rocky, but on the whole good, between two ranges of hills, which have grass half way up; above they are bare, and their fractured summits are whitened with snow. Six furlongs and a half: road in general over beds of snow, with the Nudee close on the left; the snow is old and hard, with half a foot of new snow on the top. Six furlongs: road upon snow one and a half to two feet thick, and a steep ascent. Cross seven or eight small streams, which run to the left and form the Shatool-Tee. The path lies in a dell between two ranges, and in the middle of it is a rocky ridge, with little new snow upon it, and a stream on each side; the rocks here are between mica slate and gneiss, with much felspar lying in large blocks. One mile and one furlong: a very steep and fatiguing ascent, upon beds of snow cracked in many places; passed by one fearful rent, many feet deep. Here observed the sun's altitude. Four furlongs: a steep ascent upon snow-beds to the top of Rol, or Shatool Pass, which terminates Koonawur in this direction. Here are piles of stones without cement, called Shugar, upon which travellers frequently put rags. A fur-

long from last station passed the skeleton of a Puharee who perished from cold last year; a cloud came on just before I reached the pass, and the Puharees more than once intimated their doubts that all the people would not be able to cross the pass that day. The rocks here are of a stone between gneiss and mica slate, inclined to the horizon at an angle of 10° or 15°. The barometer showed 17°.21, and the thermometer was 41°, which will give the height of this pass at least 15,000 feet. In a clear day a spectator would no doubt command an extensive view, but I could see nothing, as clouds rolled around in every direction. Four furlongs and a half: the road, with little variation, was a steep and tedious descent upon old snow, with about two feet of new on the top, which is quite soft. Five furlongs and a half: a very steep, slippery, and difficult descent upon beds of congealed snow, with a foot of new above, and here and there some pieces of bare rock. Crossed two or three rivulets on the way, which run to the right. Had an opportunity of measuring the old snow, which was from four to seven feet deep. Road very dangerous, from the fissures in the snow-beds being often choked up with what has lately fallen, which is quite soft. One of my servants fell into a chasm about three and a half feet deep and hurt himself considerably. Three furlongs: descending steeply, mostly through snow, with some rocks of mica slate and gneiss. Here leave the snow, to the left, it forms a rivulet called the Undretee; half way, cross a small stream. Two furlongs and a half: road good, descending slightly,

skirting a right-hand range upon soil producing meagre vegetation. The rocks are of mica slate, and imperfect gneiss, with a great deal of felspar. Crossed the small rivulets passing to the left. Three furlongs and a half: a good footpath upon a right-hand range, with the Undretee covered with snow beds a furlong on the left. One mile: Crossed three rills running to the left. An excellent road, descending gently in a dell between two spurs of the Himalaya, with the Undretee 300 yards on the left. This valley is adorned with many European plants and flowers of various tints. There is much snow in the Undretee, and some few patches in the ravines of the surrounding mountains, which are of gneiss and mica slate, presenting a succession of crags near their summits, but below clothed with grass. Five furlongs: cross four streams, all flow to the left and join the Undretee. Four furlongs: one furlong from this, crossed a stream. Road much the same, lying in a verdant meadow, chequered with numerous Alpine shrubs. On either side of the Undretee, considerably below the footpath, are Bhoj and Spun, and further down the stream, forests of Khursoo and Leem. Four furlongs: footpath similar to camp on the bank of a stream about half a mile from the Undretee. This morning there was a very hard frost; the wind blew sharp and piercingly cold from off the Himalaya range. It had not rained during the night, but the people were very averse to get up, and strongly advised me not to attempt the pass to day, but make a march of about four miles, and halt under the shelter of a rock, and they would return for

fuel. I, at last, succeeded in getting them to move, so we set off at 8 A.M., and had a continued ascent of about 3000 feet to the pass; the latter part was steep and tiresome, and the perambulator got clogged with snow and would not turn. When we fell in with the skeleton of the Puharee, the Goorkalees, in particular, grew very much afraid, and one little rascal said, that they would soon be all like that man, and that it was the natural consequence of crossing such mountains. I felt greatly inclined to give him a thrashing, but only pelted him with a few snow-balls, and told him to be silent, and on we proceeded. By the time we reached the pass, when, it became cloudy, the inhabitants of Panooee got alarmed, and said if it came on a shower of snow, accompanied with wind, they knew not the consequences that might happen. I bid them go on as fast as they could, and remained a short time at the pass, in hopes the clouds would clear away to enable me get a few bearings. The atmosphere, however, got more obscured, so I moved onwards after staying half an hour. The rocks on either side of the pass are of a slatey kind, and heaps of fragments hurled from the surrounding peaks appear around, smashed in pieces and lying above the snow. These are also brought down yearly by frost which splits the rocks, so it seems probable the Himalaya are daily diminishing in height, although imperceptibly. From the pass to camp, the road was a descent of nearly 3000 feet, as shewn by barometer. At first it led over snow beds, under which we heard streams running; latterly it lay upon grass, and strawberries growing

in a rich soil formed almost wholly of decayed vegetables. I did not find the least inconvenience from the rarefaction of the air, or poisonous plant mentioned by former travellers. It began to rain, sleet and hail, about 5h. P.M., a little before I reached camp, and did not cease till late at night. No tent arrived, and I got a blanket put up on a couple of sticks, through which the rain rushed in a continued torrent from a strong and keen wind. We had reached the first cluster of bushes, but the fuel would not burn. My bed and all my clothes were drenched through, and I passed a most uncomfortable night, without a wink of sleep, and almost chilled to death. The barometer was 19.48, and the thermometer 41° about 8h. P.M.

September 29, 1817. Rol, 3m. 7f. Thermometer at sunrise 31°. Four furlongs: road indifferent and rocky, upon a right-hand hill, generally an ascent, sometimes steep. The Undretee about half a mile on the left, with Spun, birch and Khursoo trees on its banks. Crossed three small streams with some snow; there is also a good deal of snow in the Undretee. Five furlongs: in general a descent; road tolerable. One mile and five furlongs: a steep slippery descent upon soil and through forest trees of many descriptions; the Khursoo, holly, Sungeha pine, and small bamboos or Speek, are in plenty. Here saw a hare. Three furlongs: road good, descending through Khursoo, Leem and Ryung trees. Six furlongs: a good footpath descending upon a right-hand hill, latterly through cultivation to Camp at Rol, a large village in two divisions, with the houses slated.

Crossed two streams on the way. Marched at 7h. 46m. A. M. and reached camp at 10h. 30m. A. M. The Undretee or Sheear Nudee lies about a quarter of a mile S. E. of the village, and the rapidity with which it augments in size in so short a space, is almost inconceivable. I traced it down from its source amongst the snow for about two miles, and left it an inconsiderable stream flowing smoothly. Here, however, it is unfordable, and is hurried down with impetuosity. Across the Undretee to the eastward, is a range covered with birch, Leem, Spun, Khursoo and Ryung; the new snow extending far down. The Puharees began to entertain great fears for the safety of four people, viz. two Begars, a Sepoy, and Khulassee, that had not been seen since the day before yesterday. I accordingly despatched two of the inhabitants of Rol with some baked bread towards the Pass, to bring me some tidings of them. They set off at noon and promised they would get within three miles of the Pass that night, and that they would not fail to inform me next day of their success. The Panooee people said another fall of snow would shut up the Pass entirely, and they seemed to hesitate about returning by the same road; some were for going by Soorahun, which is three marches round: however, after a long consultation they agreed to try the Pass, and marched at 1h. P. M. intending to proceed as far as they could. The mountaineers in crossing the Himalaya in bad weather, usually make the first march to within two or three miles of the Pass, and remain under some rock, without fire, for the night. Next morning they have the

whole day before them to cross, and should they find it impracticable they have time to return, at least, to where they passed the night. They are very unwilling to encamp five or six miles from the Pass, and when necessity obliges them to do so, they prefer making a march of only three or four miles next day, and would fain have persuaded me to do the same. Rol is situated in Joogao of Choara in Teekumdass's Wuzeeree. Shatool Pass is reckoned the most difficult of the Ghatees to Koonawur, of which there are two others, Boorendo and Goonas. Boorendo Pass lies about two marches east of this, and is the easiest and most frequented. Goonas is steeper and is a little out of the way from Choara. It rained all day, and the people think the Pass must be blocked up, and that the four men that were left behind must have perished amongst the snow.

September 30, 1817. Bitheean 8m. 1.5f. Thermometer at sunrise 54°. Marched at 7h. A.M. and reached Camp at 1h. P.M. One mile, and one and a half furlong: road tolerable, but very slippery from the late rain, a descent upon soil, with many cultivated fields to the Genawee Garh, a stream one foot and a half deep, running to the left, and joining the Undretee, one furlong below. Close to camp crossed a rivulet, and three furlongs on this side of it passed through a part of Rol. Two furlongs and a half: footpath indifferent and rocky upon the right bank of the Ingroroo or Undretee, and through thickets: the last 100 yards is an ascent. Across the Undretee the range is covered with different kinds of fir. One furlong and a half: road bad and

rocky upon the bank of the Ingroroo to a Sango, where cross the stream, which is rapid, to the left bank. Five furlongs and a half: road pretty good, being an ascent, sometimes steep, up the side of a hill covered with several kinds of pine. Three furlongs and a half: road similar, ascending upon a left-hand range. Three furlongs and a half: road good and even, upon a left-hand hill, with the Undretee lying half a mile on the right, to Jabul. Crossed three streams passing to the right. Seven furlongs and a half: road not so good, being a descent steep and rocky in some places, and slippery in others: one furlong from this crossed a stream, which runs to the right, and here crossed the Gopgarh Nudee by a bad Sango. This stream is about one foot deep, and likewise passes to the right. One mile, two and a half furlongs; one furlong from last station crossed the Sheear or Undretee, over a crazy bridge of a few thin trees; one hundred yards further passed a water-mill lying on the left, and 150 yards further the remains of a good Sango over the Undretee. The road is capital and even: after crossing the Sheear it lies for half a mile close upon the right bank of that stream, through high fern, then ascends for one furlong, crossing a stream, and the rest is plain upon a right-hand range, with pines and other trees on each side of the stream. Seven furlongs and a half: road good and even, upon a right-hand hill, with some cultivation, and the Undretee lying one furlong on the left to Doogal. A quarter of a mile from last station crossed a stream: 100 yards further another; half a mile further the Koomretee Garh, half a foot deep, with

a water-mill on its bank, and close to the village passed a rivulet. Three furlongs: road good and similar, crossing a Khud a quarter of a mile from last station, and near this two small rills all passing to the left. Here observed the sun's altitude. Two furlongs and a half: Kanthul fifty yards to the left. Half way crossed a rivulet. One furlong and a half: Roostoar to the left. Seven furlongs: road good upon a right-hand range, with the Sheear or Undretee lying half to a quarter of a mile on the left, to camp at Bitheean, a small village in Googao. A quarter of a mile from last station, crossed a rivulet; one furlong on this side of it passed Theouthee, lying 100 yards on the left, and close north of camp crossed a stream passing to the left to join the Undretee, about half a mile distant. There is a great deal of cultivation near the villages on the banks of the Undretee: many rice fields. The hills on this side above, are fringed with woods of pine; across these are a few firs near the Nudee; further up, the sides of the mountains are well cultivated, and their summits are covered with forests of pine and holly. There was much rain this afternoon. Two people arrived from Rol late at night, and informed me that the men I dispatched to the Himalaya returned to-day, with the Sepoy Khulassee, and Begars all well, only their feet and legs were sore and much cut by the intense cold. They met them a little this side of the Ghatee, and helped them on with their loads. The barometer was broke to-day: it would not have answered for this place, being too short; but I wished to compare it at Hutoo, to see its probable error.

October 1, 1817. Rooroo 11m. 1.5f. Thermometer at sunrise 53°. Seven furlongs and a half: road in general good, being a descent slanting down the side of a hill to the Undretee, where there is a Sango across it: crossed two rills near this. Seven furlongs: road good and even, close upon the right bank of the Undretee: a quarter of a mile from last station, crossed a stream; a little further passed a water-mill, and here is another. Cheergaon across the Undretee 120°. 1f. A good Sango here. Three and a half furlongs: A fine plain road through cultivation, to Bhounro. The Pubur and Undretee unite 200 yards on the left: the Undretee has increased in size astonishingly since leaving Rol; it now appears a large river, and joins another larger, whose source is two long marches to the eastward in Tukral of Choara. Along the banks of the Undretee and Pubur is fine level ground, here almost a quarter of a mile in breadth, and laid out in rice fields, well watered by Kools from the river. Four furlongs and a half: a capital even road through rice fields to Soondo in Budreedass's Jageer. One mile one furlong: road fine and plain through cultivated fields with the Pubur, about one furlong on the left, across which is a range covered with pines. The cultivation here is almost wholly rice, to Mandloe Kotee in Teekumdass's Jageer. One mile one furlong and a half: footpath for the first three quarters of a mile good and even; rest ascending and descending steeply upon rocks, with little room for the feet, a precipice on the left, and the Pubur close below. Two furlongs: road tolerable but rocky, on a right-hand range with the Pu-

bur close on the left. One furlong and a half: a steep descent to the Muchrer Garh, broken into two streams; cross the first by a bad Sango, and the other is forded. There is about 100 yards between them, and along its banks are fine rice fields: each of the streams may be 1½ feet deep. Six furlongs, road bad, rocky, and dangerous, footing insecure, and overhanging the Pubur, which is here deep and smooth, lying close on the left some hundred feet below. Opposite this is a kind of Sango across the river, even with the water. One mile, three furlongs: road good and even, parallel to the river, which lies 200 or 300 yards on the left to Seema village, with many rice fields around it. Close to this passed a fine Boulee on the right, from which flows a small stream. One furlong: close to Seema crossed a stream, and here another. Two miles and half a furlong: road good and level, upon the right bank of the Pubur, sometimes three hundred yards from and sometimes touching the stream: there are a good many fields on the bank of the Pubur, which is broad, and broken into several streams with many sand banks. Five furlongs: here observed the sun's meridian altitude. Five furlongs and a half: road even, and skirting a canal to camp at Rooroo. Left Bitheean at 7h. A.M. and reached Rooroo at 12h. 30m. P.M. The country exhibited a pleasing appearance, being most part of the way a spacious vale in the highest state of cultivation, with the Pubur, a large transparent river, well stocked with fish, winding through it. The verdant hills on either side ascend with a regular slope, and are

lined with hamlets and diversified with fields. The rocks noticed in the last two marches are mostly mica slate, with a few pieces of gneiss and quartz now and then. There was a heavy shower of rain this morning.

October 2, 1817. Kooee, 7m. 6.5f. Thermometer at sunrise 54°. Two furlongs and a half: a slight descent. Five furlongs: road good and even; two furlongs from last station crossed a stream of the Sheekre; went up its right bank, and re-crossed it here. It forms an island upwards of a furlong in breadth, which is mostly cultivated. Seven furlongs and a half: road even and swampy, through rice-fields, upon the left bank of the Gadh, which is broken into two streams, and forms an island; Onoo one furlong on the right. Seven furlongs: road good, along the left bank of the Garh, and twenty to thirty feet above the stream. A little above to the right, the ground appears to be plain and well cultivated; across to the left are some pines on the hills. One furlong: here is a Sango across the Khud, elevated thirty-five feet above the stream. Two furlongs: road good, ascending upon a right-hand hill. Half way, crossed the Bitharee Garh by a rude alpine bridge of two fir trees, which connects the precipitous banks at the height of at least sixty-five feet above the stream. The Nudee runs to the left, and joins the Sheekree at a short distance. One mile: a good road upon a right-hand range, with the Sheekree close on the left, 300 feet below. Four furlongs: road similar, winding very much. Half way crossed the Kure-ouree Nudee, a small stream passing to the left.

Six furlongs: footpath good, upon a range that lies to the right. A quarter of a mile from the last station passed a Dogree lying on the left; and a quarter of a mile further, crossed a small rill running to the left. Five furlongs: road good, being a slight descent to the Choonsh or Seekree Nudee; cross it; about one foot deep. A quarter of a mile from last station, crossed a rivulet passing to the left. Three furlongs: a steep ascent from the Nudee; road good. One furlong: Dharo on the right. One mile two and a half furlongs: road good; a fatiguing and pretty steep ascent to camp at Kooee; marched at 6h. 45m. A.M., and arrived at Kooee at 10h. 45m. A.M. The road lay chiefly upon mica slate, with a few pieces of quartz, and latterly some clay slate. The hills have a moderate slope, and in general are grassy and unwooded. There is a great deal of cultivation around all the villages, and the crops have a flourishing appearance. A shower of rain fell this afternoon. The people that were left behind on the Shatool Pass, came up this evening. They said, that the first day they remained about two miles on the other side of the Ghatee, below a rock, and it snowed the greater part of the night. Next morning it was still snowing. They marched, crossed the pass with great difficulty, the snow being deep, and it took them up the whole day to reach a place three miles on this side of the pass, where they halted as on the preceding night, without either fire or food. Early the third morning they met the people I sent off from Rol, who gave them some bread, and helped them on with their loads.

October 3, 1817. Reolo, 12m. 7.5f. Thermometer at sunrise 55°. Four furlongs: a good road through Cheer and Keloo trees, upon a left-hand hill. Four furlongs: road much the same, upon a right-hand range. One mile two furlongs: good road, except the last quarter of a mile, which is sometimes rocky, sometimes slippery, with hardly room for half the foot, all the way upon a right-hand range and through scattered Cheer and Keloo trees. Cross a stream. Three furlongs: footpath good, upon a right-hand hill. Keolee 100 yards on the left. Six furlongs: cross two small rivulets. One furlong: cross a stream. One furlong: cross two streams. One furlong: cross a rill; all run to the left. Two furlongs: road tolerable, but often slippery, an ascent the whole way, frequently steep, upon rich soil beautifully variegated with European shrubs and odoriferous flowers of various hues. I here recognised the Sooruk Doeken, thistle, tansy, nettle, strawberry, vine, sage, thyme and foxglove, besides numerous other familiar plants. This range must be upwards of 10,000 feet; it has many Kyl, Keloo, Row, and yew trees upon it. One mile five furlongs: road good, mostly an ascent, generally upon a right-hand range, and in a few places steep. The dell to the north of this range was visible from one part of the road; it is low, and there are many Mouroo trees on the south face of the hill. Seven furlongs: a good road, latterly upon the top of the Dhar. Two miles six furlongs: a good road the whole way, upon a right-hand range, the last mile through dark-coloured forests of Mouroo. All along a deep, rich soil

yielding a large collection of beautiful wild plants. To the left below are pines, mostly of the Row and Kyl kind. Half way: crossed two small streams about a furlong apart, and half a mile from this, two others sixty yards asunder. Nowagurh Fort, in ruins, 100 yards on the right. One mile one furlong: a good footpath upon a right-hand range and through Mouroo trees. Here observed the sun's meridian altitude. One mile two furlongs: a good road, slightly descending, the first half of the way through very thick Mouroo woods, upon a right-hand range. A quarter of a mile from last station, crossed a stream, and a quarter of a mile further, another. Bagee Fort, in ruins, 303°, distant a quarter of a mile. One mile two and a half furlongs: road in general good, a tolerably steep descent down the side of a hill to camp at Reolo, or Shyl, a large village in Mustgurh. Marched at 6h. 30m. A.M. and reached Reolo at 2h. P.M. It rained heavily the last half hour. The rocks noticed to-day were mica slate and imperfect gneiss.

October 4, 1817. Reolo to Hutoo and back, 8m. Thermometer at sunrise 46°. Four miles: arrived at Hutoo at 8h. 30m. A.M. a march of two and a quarter hours, and a steep, tiresome ascent. One mile two and a half furlongs: a descent, sometimes slippery, upon a left-hand hill; last three quarters of a mile, through Khursoo and Mouroo trees. Kureena Fort, in ruins, 100 yards to the left. One mile five furlongs: a steep descent, footpath good. The first mile, through thick holly, latterly upon a grassy hill; half a mile from this, crossed a stream running to the right. Five furlongs and a half:

crossed four small streams; these run to the right and form the Bagee Khud, a branch of the Chegounte. Road tolerable, descending latterly through small Keloo trees and upon soil. Three furlongs: a slight rocky ascent to camp at Reolo. Left Hutoo at 1h. 45m. P.M. and reached Reolo at 3h. 45m. P.M. No cultivation except near the base of Hutoo range.

October 5, 1817. Kotgurh, 10m. 3f. Thermometer at sunrise 45°. One furlong and a half: road tolerable, ascending. Seven furlongs: road a rather steep ascent, but good, crossing three streams. Bagee one furlong to the right and above. Two furlongs: a slight ascent along the Suruk that leads from Kotgurh to Teekur and Raeen. Here cross the range. One mile one furlong and a half: a good road descending through Ro and Pundro trees; three quarters of a mile from this, passed a Boulee lying on the left; and a quarter of a mile this side of it, crossed a stream running to the right. Two miles four and a half furlongs: road for the first half a mile a very steep descent to a Khud; the next three quarters of a mile pretty even, slightly ascending, and descending to another Khud; then there is half a mile of similar road to another Khud, this side of which, 100 yards distant, crosses a small stream. The rest is generally an ascent, often steep, crossing two rivulets, 100 yards apart; three furlongs from the last Khud and close to this, another small stream issuing from a Boulee on the left. All the streams run to the right and form the Bearee Nudee. The path is pretty good, and winds very much to clear the Khuds; it lies upon

a left-hand range through a thick wood of Roo, Kyl, Keloo, yew, and horse-chestnuts, to Noon. One furlong: a steep ascent to another part of Noon. Five furlongs: a steep and fatiguing ascent up the side of a hill and through Kanta brushwood. This is the top of a ridge, and there are some Keoulee here; three furlongs from this, crossed a stream running to the right. One mile four furlongs and a half: first half mile a steep descent through Kanta, brushwood and pines, to a Khud running to the right. Next half a mile, a good road ascending through Jungul, and crossing a stream, then cross the Hutoo range, and proceed along a right-hand hill to Jurol. Three miles: road as before to Kotgurh. Marched at 6h. 45m. A.M. and reached Kotgurh at 11h. 30m. A.M.

October 7, 1817. Dunar, 8m. 3f. Five furlongs: good road, descending; a quarter of a mile from Kotgurh; passed through the Chounee, and one furlong from this passed Deemree, a house, which lay on the right; here crossed a stream that issues from a Boulee, on the left. One mile three furlongs: indifferent road, descending steeply to the Soar Nudee, a fine stream passing to the right, that divides Sindoch from Koomarsaen; half a mile from last station, passed through Sukoondee, and half a mile further through Cheemlo. One mile six furlongs: road for the first mile an ascent, often steep, rest more level to Burara. One furlong from last station crossed a stream; three furlongs further, passed through Puneoug; two furlongs further, crossed a rivulet; one furlong further, another; 300 yards from this, passed a

Boulee lying on the left, and 100 yards on this side of it crossed a small stream. One mile one furlong: road good and even, upon a left-hand range, and through cultivation. Five furlongs from last station passed through Muteog, and 100 yards this side of it crossed a stream. Lathee 100 yards to the right. Koormarsaen, the residence of the Rana, a quarter of a mile to the right, and below. Four furlongs: road and country similar. Five furlongs: road good, slightly descending upon a left-hand hill; one furlong from this crossed a stream. Four furlongs: road good, being a descent, latterly rather steep, to the Kreenj Nudee; cross it; one foot deep, running to the right. Four furlongs: a steep ascent to Khabur, which is to the left. One mile one furlong: road good and even, still upon a left-hand hill, to a small stream running to the right; three furlongs from this passed Pusher, lying one furlong on the right, north of the Khud. Two furlongs: road even, through field to camp at Dunar, a village of five houses. Marched at 7h. A.M., and reached camp at 11h. 45m. A.M. The country at first was well cultivated, but for the last two miles and a half, the fields were very thinly scattered, and occupied small spaces. The hills in the vicinity have many Kyl upon them, especially near their summits. The rocks are mostly mica slate, with some pieces of quartz here and there.

October 8, 1817. Padwa, 11m. 1f. Thermometer at sunrise 50°. Seven furlongs: road good, mostly through pines, ascending to Kuehen Ghatee. One mile four furlongs: a good road, descending slightly upon a left-hand range, and through oak and fir to

the Tale Nal Garh, a small stream running to the right. One mile: road good, upon a left-hand hill, ascending gradually through pine and oak; one furlong from last station crossed the Dusrera Nudee, and this side of it, four small streams, each about a furlong distant, all running to the right. One mile four furlongs: road good and even, upon a left-hand range, and through a thick forest of oak, Cheer, Keloo, and other trees. Four furlongs: road good, upon the top of a small ridge. Thao fort in ruins 100 yards on the left of the road, and Kangul half a mile. One mile seven furlongs: road good and even, near the top of a range, which lies sometimes to the right, sometimes to the left; seven furlongs from last station passed a Boulee, which lay on the left, and one furlong further, the village of Kaenthul lying on the right, to Hutheea. Two miles three furlongs: a very steep descent down the face of a hill, road cut into zig-zags of eight or ten feet at acute angles, and strewed with small stones of a blueish kind of limestone, to the Kundroo Nudee, one foot deep, which comes from Cheechur Dhar, and runs N. 82°, W. and S. 82 E.°; here cross it. Seven furlongs: road good and even, upon the face of a left-hand hill, with the Kundroo 200 to 300 yards to the right. Shalee one furlong on the left; a quarter of a mile from last station passed Wala, lying a furlong on the right, across the Kundroo. Five furlongs: road similar, lying near the Sutluj, to camp at Pudwa, a village of two houses with a Deota, in Bhujee, 200 yards from the river. Bhujee extends to the Kundroo Khud, and the villages of Sooee and Wala also

belong to it. Marched at 6h. 30m. A.M., and reached camp at 2h. 30m. P.M. At first the rocks are of mica slate, then clay slate to Kangul, from whence they are of limestone, varying from a light blue to a dark purple. Not much cultivation occurred in this day's march, except latterly.

October 9, 1817. Khera 10m. 0.5f. Thermometer at sunrise, 59°. Four furlongs: road good, through rice fields. Seven furlongs: Bithora on the left: under this a Jhoola across the Sutluj. Two furlongs: road good and even, along the left bank of the Sutluj, and from 200 to 300 yards distant from it. The banks of the river on either side are composed of pink-coloured limestone, dipping up the stream at an angle of 10° or less with the horizon. Half way crossed a Khud, which runs to the right: an ascent from it. Malgee a large village on the left. Five furlongs and a half: road similar, about 400 feet above the river: one and a half furlong from this passed Pipiltoo, lying a furlong on the left. One mile one and a half furlongs: road good, chiefly a slight ascent to Oglee. All along beautiful rice fields on both banks of the river, which lies a short distance on the right; a quarter of a mile from last station passed Sal, lying 300 yards on the left; one furlong further, crossed a stream; and three and a half furlongs further, a Khud passing to the right. Seven and a half furlongs: road similar and good, 500 or 600 feet above the river. The rocks here are all limestone, dipping to the eastward at an angle of 50° or 60° with the horizon. Four and a half furlongs: a steep descent down to the bank of the river. Two fur-

longs: road good and even, upon a left-hand hill, with the Sutluj lying close on the right. The river is here confined by perpendicular cliffs only, about sixty feet broad, and rolling along smoothly in a deep azure stream. The hills on this side of the Sutluj have pines on their summits, those across are generally bare. Tula 300 yards on the left, and above. Five furlongs and a half: road capital and even, lying upon a flinty kind of limestone close on the left bank of the river. Five furlongs and a half: road similar, on the left bank of the Sutluj. Crossed two rivulets near last station. Four furlongs: a fine level road through cultivated fields, with the river a quarter of a mile on the right. Three furlongs: road similar, winding much; one furlong from last station, passed Burara, lying 100 yards on the left; and two furlongs further, crossed the Koonree Nudee, one foot, deep and rapid, running to the right. Jush one furlong to the left. Five furlongs: road good, with the Sutluj quarter of a mile to the right; between it and the road, fine fields of rice chiefly. Two furlongs: one furlong from last station cross a stream. The Sutluj here is very narrow, hemmed in between rocks of limestone, deep and still. Three furlongs: short ascents, and descents, sometimes steepish. Five furlongs: road ascents and descents, winding much, about 800 feet above the river; 100 yards from last station passed a Boulee lying on the left. Five furlongs and a half: road good and even upon a left-hand hill, with the Sutluj half a mile to the right to camp at Khera, a small village romantically situated between high hills. Marched at 6h. 30m.

A.M. and reached Khera at 11h. 30m. A.M. There is a great deal of cultivation here, and in general many fields on both banks of the river. The hills on each side are high, steep, unwooded, and cloth-ed with grass. From this place there are two roads to Soonee. The one leading along the left bank of the Sutluj is rocky and dangerous, lying upon precipitous crags, with the river close below. It is about three miles shorter than the other, but seldom travelled by loaded people, as the footing is very unsafe. The other road is the Suruk, which ascends the high Ghatee of Kudhar. There are several caverns in the rocks on both sides of the river, in which people sometimes reside, but they are chiefly used for cattle.

October 10, 1817. Soon or Soonee 10m. 6f. Thermometer at sunrise 63°. Two miles two furlongs: road for the first half mile good, between two hills to a Khud running to the right; the next mile is an ascent, and the rest a very steep one to the top of Kudhar Ghat; one furlong from camp passed Choukee, lying a furlong on the right, and one furlong further Pulug on the left. One mile five furlongs: road a steep descent down the side of a hill, between two ridges to the Noutee Nudee. For the first half a mile the way winds much, in short zig-zags, and is very rocky, and cut up by the rain, all the softer parts being washed away, and large masses of rock remaining. From Khera to this the hills are of limestone of various colours, the most common being dark and light blue, white, pink, and flint. Cross the Noutee Nudee, forty feet broad, and one and a half feet deep. It comes

from Theog. Here is a water mill. One mile four and a half furlongs: a good even road, ascending very gradually upon a left hand range, with the Noutee, about a quarter of a mile on the right; half a mile from last station crossed a stream, and three furlongs from this passed Phunera, lying on both sides of the road. One mile two furlongs: road good and even, chiefly a very gradual descent upon a left hand range, with the Nudee a quarter of a mile to three furlongs on the right. Five furlongs and a half. Road similar, about a mile from the left bank of the Sutluj. Mukursa one furlong. Sikrora three furlongs. Three furlongs: a fine road through cultivation, with hedges on each side. Five furlongs: a descent to Rujera on the left all the way through Kanta and other brushwood; Sutluj lying a quarter of a mile on the right; one furlong from this crossed a Khud. One mile: road good and even, through fields with the Sutluj, one to three furlongs on the right. About Sikrora is a fine level spot about one mile long, and a half a mile broad, laid out in rice fields. Crossed two streams. Three furlongs: crossed five rills. One mile: road good, the last quarter of a mile a steep ascent to Soon or Soonee, the capital of Roodurpal Rana of Bhujee. A quarter of a mile from last station crossed a stream which turns a water mill, and between it and camp four rills. Marched at 6h. 30m. A.M. and reached camp at twelve. There is a good deal of cultivation on the banks of the Noutee Nudee, and from Mukursa to Soonee is a complete garden, the ground plain, soil rich, and crops luxuriant. From Soonee towards the river

distant a quarter of a mile to three furlongs, is a large flat beautifully cultivated. Across the Sutluj in Sooked are likewise many fields. The hills are all limestone of many hues, often inclining to the pink, and most of them are covered with brushwood, but have no trees. The Rana of Bhujee has gone upon a pilgrimage to Jagurnauth, and his Wuzeer at present governs the country. He paid me a visit, and sent grain for all my people. Near Soonee gold dust is found in the sands of the river in small quantities.

October 11, 1817.—Sooreea, 10m. 5f. Thermometer at sunrise 57°. One mile one furlong: road good and even, chiefly through fields, mostly of rice, with the Sutluj from one furlong to a quarter of a mile on the right; crossed two small streams. Gireeana on the left. Here quitted the Suruk. Six furlongs: road in general even to the Sutluj. Crossed a stream. This is a little out of the way, but I wished to see the hot springs in Sooked. Crossed the Sutluj upon inflated skins, to see the hot wells, or, as they are called, Tupta Panee; there are eight or ten springs, all situated about the same distance from the river, two or three feet, amongst pebbles, which appear to be limestone. The water bubbles up and incrusts the stones with a whitish kind of substance. It has a strong sulphureous smell, and disgustingly saltish taste. The thermometer plunged into them was raised to 130°.5, whilst the temperature of the river was 61°. As the Sutluj rises, they say the springs recede and keep nearly the same distance. There is a Thakoordwara here; the rocks near this are all lime-

stone, dipping to the eastward at an angle of about 15°; re-crossed the river. Three furlongs: here is a Tupta Panee on the left bank of the Sutluj, but not near so hot as those in Sooked. Half a furlong; road a rocky ascent upon limestone, crossing three streams to Puleear on the left; here join the Suruk. Two furlongs and a half; ascending to Jumog. Three furlongs; a good road, ascending. Six furlongs; a quarter of a mile from this, crossed a stream; Joon 100 yards to the right. One mile; road good, ascending, not very steeply, to Mudhor Ghat; a Debee on the left; here crossed the range. Six furlongs; a quarter of a mile from last station, passed a Boulee lying on the left. Two furlongs; road good, a moderate descent on a left-hand range, with the Synj Nudee, one furlong to a quarter of a mile on the right, and below. Seven furlongs; a tolerably steep descent to the Synj Nudee; cross it; two feet deep, passing to the right, and rapid; the Kookree Nudee joins it one furlong below. Six furlongs; first 100 yards a rocky ascent and descent; rest good and even, along the right bank of the Kookree; some fields of rice here. One mile; road good, and even, upon the bank of the Kookree Nudee; half way, cross it, and here re-cross; here observed the sun's altitude. Two furlongs; road tolerable, a pretty steep ascent. Crossed the Kookree 100 yards from last station. Two furlongs; a good road to Nuhra on the right bank. Many fields here; a quarter of a mile to the south is a Khud which divides Bhujee from Baghul, and, the Kookree Nudee separates both from Dhame. Five furlongs; road good, the

first quarter of a mile a descent to a Khud, which divides Bhujee from Baghul; rest an ascent, sometimes steep and stony, through brushwood; 300 yards from this, passed Bara lying on the left. Five furlongs and a half; some brushwood on the right. Three furlongs and a half; a good even road upon a right-hand hill to Sooreea in Baghul; a quarter of a mile from last station, passed a Boulee lying on the left. Marched at 7h. 30m. A.M., and reached camp at 1h. 30m. P.M. As far as the Synj Nudee the rocks are of limestone, and from thence to camp, clay slate.

October 12, 1817.—Urkee, 8m. 4f. The thermometer at sunrise 52°. Seven furlongs; road good, being first a descent, then a gradual ascent up the bed of a Khud; some fine cultivation here. One mile one and a half furlongs; road at first a descent of 100 yards to a branch of the Khud, cross it, and then ascend for three furlongs; rest even, upon a right-hand hill. There is now a branch of the Khud close on the left, and another beyond Ser to the right. Six furlongs and a half; first enter the bed of the stream to the left, then ascend pretty steeply up it for a short way, leave it to the right, and ascend to Danora Ghat. Five furlongs and a half; a good road upon the top of a range. One mile; first quarter of a mile a rocky and steep descent to a rivulet; follow its course for three furlongs, sometimes on one bank, sometimes on the other, then ascend slightly on a left-hand range, leaving the Nudee to the right. Seven furlongs; road undulating and good, mostly upon a small ridge that lies on the right. A Khud a

quarter to half a mile on the right, and a stream one furlong on the left; one furlong from this passed Kothee, lying a furlong on the right. Two furlongs and a half; Phoun on the left; some few patches of cultivation. Two furlongs: road lies along a small ridge, and is good, with a stream on each side, beyond which are tolerably high hills, mostly barren, with short grass. One mile one furlong: road for the first half mile plain, then a steepish descent of a quarter of a mile to the Nudee; cross it, passing to the left, and then ascend steeply; three furlongs from last station passed Phawun, lying on the right. Six furlongs: road good and even, upon a right-hand hill. Five furlongs; road similar, descending a little to camp at Urkee. Marched at 6h. 30m. A.M., and reached camp at 11h. A.M. Little cultivation occurred on the road. The mountains are all clay slate. Urkee is a pretty large town, and the capital of Baghul. The Rana has a good garden here.

October 13, 1817. Hureepoor, 13m. 5.5f. Thermometer at sunrise 64°. Five furlongs: close to camp passed through the town of Urkee; a quarter of a mile this side of it crossed a Khud running to the left, and this side the Khud passed Khureean lying on the right, one furlong distant. Gahur one furlong on the left. One mile four furlongs; a fine plain road skirting a right-hand hill, with the Choee Khud lying about half a mile on the left; three furlongs from last station, crossed a Khud which runs to the left, the descent and ascent steepish, each about 100 yards; two furlongs further, passed through Bathul, and crossed a stream that runs

through the village. A great deal of level ground well cultivated hereabouts. Five furlongs: road similar, winding much to clear some ravines; 300 yards from last station, passed Tukhouree, which lay on the left, and close this side of it, crossed a stream running to the left, on the bank of which is a stone Debee. Dangree on the right. One mile three furlongs: road good and even, upon a right-hand range, Small hills across the Khud to the left; one mile from this, crossed a small stream. Mujat on the left. Four furlongs: road much the same, with the Choee Nudee one furlong on the left. One mile five furlongs: the first half mile is a steep descent to the Koonee Khud; cross and recross it four times, then follow the course of the stream on the right bank for three quarters of a mile; cross, re-cross and cross it again; go down the left bank for one furlong, and ascend gradually from its bed, leaving the stream, which is about a foot deep, to the right. Rocks here of mica slate with blocks of limestone. The direction of the strata N. 38° E. and S. 38°. W. Three furlongs: a good road upon a left-hand hill; quarter of a mile from this, passed Beerun, a large village lying one furlong on the left. Here cross a stream which runs to the right and joins the Koonee. There are four or five water mills on its bank. Four furlongs: a good even road amongst small hills; quarter of a mile from last station, crossed a small stream which joins the Koonee. Two furlongs: half way crossed a stream running to the right. One furlong and a half: a good even road to Huthee in Kooneear. One furlong: a fine plain, well cultivated, and a

tank to the south of the village. Kano, the residence of the Rana of Kooneear, 114°, distant one mile. One mile one and a half furlong: road good and even, through fine plain cultivated fields. Two miles two furlongs: road good, crossing and recrossing the Kooneear Khud. Rocks here of mica slate; direction of strata N. 5° E. and S. 5°, W. almost perpendicular. Four furlongs: road similar. Kuneeara one furlong on the right. Four furlongs: road even, in the bed of the Row, crossing it frequently; one and a half furlong from last station is Buror, lying a furlong on the left; and here Churawa is close on the left. One mile three furlongs: road good, crossing the Row often; half a mile from this, leave it to the right, and ascend gradually slanting upon a left-hand hill to Hureepoor. One furlong and a half: a good road to camp, on a rising ground near Hureepoor. Met my brother James at Urkee. Marched at 6h. 3m. A.M., and arrived at Huthee of Kooneear at 10h. 30m. A.M., breakfasted and set off at 1h. 30m. P.M., and reached Hureepoor at 4h. 30m. P.M. It was our intention to have proceeded on to Soobathoo, but we here found our brother Patrick on his way to Kotgurh, and Mr. Master on his return from it, so we stopped.

October 14, 1817. Soobathoo, 4m. 1.5f. Thermometer at sunrise 58°. Marched at 6h. 15m. A.M. and reached Soobathoo at 7h. 45m. A.M.

Table of differences of Longitude by Chronometer.

Date.	Daily Rate of Chronometer.	Names of Places.	Chronometer fast at noon.	Remarks.			
1817.							
5 Sep.	Daily rate of gaining 38″·55	Kotgurh	By equal altitudes . 29′ 5″·72	Difference of Longitude between	Soobathoo and Kotgurh	30′ 17″	East.
9 „		Rampoor	By equal altitudes . 31 4 ·40	„ „	Kotgurh and Rampoor	8 53	„
13 „		Turenda	By equal altitudes . 32 40 ·37	„ „	Rampoor and Turenda	14 34	„
15 „	Daily rate of gaining in 11 days 37″·06	Wangtoo	By equal altitudes . 33 29 ·17	„ „	Turenda and Wangtoo	7 4	„
21 „		Rarung	By equal altitudes . 35 52 ·78	„ „	Wangtoo and Rarung .	19 49	„
25 „		Chegaon	By equal altitudes . 39 21 .02	„ „	Rarung and Chegaon .	15 0	West.
26 „		Wangtoo	By equal altitudes . 40 16 ·82	„ „	Chegaon and Wangtoo	4 49	„
1 Oct.	Daily rate of gaining 38″·55	Rooroo	Single altitude . . 44 31 ·50	„ „	Wangtoo and Rooroo .	15 29	„
2 „		Kooee	By equal altitudes . 45 24 ·30	„ „	Rooroo and Kooee .	3 34	„
6 „		Kotgurh	By equal altitudes . 48 44 ·37	„ „	Kooee and Kotgurh .	11 28	„
7 „	Daily rate of gaining going to and coming from Kotgurh 38″·51	Dunar	Single altitude . . 49 38 ·47	„ „	Kotgurh and Dunar .	3 54	„
9 „		Khera	Single altitude . . 51 42 ·45	„ „	Dunar and Khera .	11 44	„
10 „		Soonee	Single altitude . . 52 50 ·29	„ „	Khera and Soonee .	7 20	„
14 „		Soobathoo	Equal altitude . . 55 53 ·57	„ „	Soonee and Soobathoo	7 19	„

Difference of longitude between Soobathoo and Kotgurh, going . . . 30′ 15″
Ditto „ „ „ returning. . 30 16.5

Mean daily rate of gaining . . 0′ 38″.17

Kotgurh, going, difference longitude 1 58.29
„ returning, „ 2 3.84 } Mean 2′ 1″.06 Difference of longitude 30′ 15″ east of Soobathoo.

Wangtoo, going, „ 1 58.25
„ returning, „ 2 5.85 } Mean 2 2.05. Difference of longitude 30 30 east of Kotgurh

Rarung, going, „ 1 25.41
„ returning, „ 1 13.19 } Mean 1 19.30. Difference of longitude 19 49 east of Wangtoo.

NARRATIVE

OF THE

JOURNEY

IN

1818.

NARRATIVE.

1818.

September 21, 1818. Mumleeg. From Soobathoo, in lat. 30° 58′, and long. 77° 2′, situated about twenty miles from the plains, and 4,205 feet above the level of the sea, I marched to Mumleeg, 9 miles. Three miles and a half from Soobathoo, I crossed the Gumbur, an inconsiderable stream generally, but it had swollen so much from late rain, that its passage was effected with great difficulty. The road was a descent to the Gumbur, from which it slightly ascended.

September 22. Marched to Semla, thirteen miles. The road for the first eight and a half miles was almost plain, then there was a steep ascent of one and a half miles, and the last three were excellent, winding near the top of a range 7,000 feet high, and lying through a noble wood of many varieties of oak and pine.

September 23. Marched to Bunee, eleven miles. The road was level, leading through deep forests of

pine, at the height of 8,000, and 9,000 feet above the sea. Thus far, the path, which is practicable upon horse-back, has been made by a company of pioneers, for the facility of communication with the cantonment of Kotgurh, thirty-four miles further to the N. E.

September 24. Marched to Pulana, ten miles. Left the made road at Theog six miles from last camp, and descended by an indifferent and slippery foot-path to the village, which belongs to the Rana of Theog.

September 25. Marched to Kotkhaee, 11 miles. The road lay along the bank of the Giree, one of the branches of the Jumna, and was often rocky and dangerous, the foot-path being frequently overgrown with grass, and seldom a foot in breadth.

Kotkhaee is the residence of the Kotgoorh* Rana, a hill chief, under the protection of the British Government. It is situated on a most romantic spot, upon the point below which two streams unite to form the Giree. On one side the rock is 182 feet perpendicular, and on the other there is a long flight of stone steps; neither of the streams, which are only twenty feet broad, are fordable, so, by destroying the bridges, the place might be well defended against musquetry. The Rana's residence is three stories high, and has a most imposing appearance. Each story projects beyond the one beneath it, and the top is crowned by a couple of handsome Chinese turrets, beautifully adorned with finely carved wood work.

* Called also Koteghur, Kotgurh or Kotgoor.

September 26. Marched to Gujyndee, eight miles. The road, at first, lay up the rocky bed of one of the branches of the Giree, and then was a very steep and tiresome ascent of 2,400 feet to Deouree pass, 8,885 feet high, from whence there was a descent to Camp. Gujyndee, is in Nawur, a small district of Busehur, famed for its numerous iron mines. There are few spots here fit for cultivation, and the inhabitants, who are all miners, live by their trade in iron. They work the mines only about three months in the year; they commence digging them in March, after the snow has sufficiently melted, at other times they say the earth falls in, and it is unsafe to work.

September 27. Proceeded to Rooroo, a fatiguing march of thirteen miles, crossing a high range of mountains. Here we first came upon the Pubur, one of the feeders of the Tons, which falls into the Jumna: it is a stream of considerable size. The barometrical observations give the extreme height of its bed 5,100 feet.

Rooroo is situated in Choara, one of the large divisions of Busehur, and the most populous and best cultivated spot I have seen in the hills. The dell is broad, and the ground is well adapted for rice fields, being watered by many canals, cut from the river which winds through it.

Three marches more, or twenty-six miles, brought me to Jangleeg, the last and highest village in the valley of the Pubur, elevated 9,200 feet above the sea. The road, latterly, was extremely rugged and dangerous, at one time, many hundred feet above the river, with a horrid precipice on the

right, at another dipping down to the stream, which rushes with violence over the rocks interspersed in its channel. Advancing, the dell in which the Pubur flows, becomes gradually more contracted, the mountains assume a more naked and abrupt appearance, and the rapidity and turbulence of the river increases.

From Jangleeg I proceeded ten miles to a halting-place, called Moondar, within two miles of the Brooang* Pass over the great snowy range. The road was good, and lay in a broad grassy glen, between two spurs of the Himalaya, with the Pubur running in the middle. The soil of this valley is composed of black vegetable mould, which produces endless varieties of Alpine plants to the height of 13,000 feet; belts of birch and pine reach almost the same elevation, beyond which scarcely anything is seen but patches of brown grass.

The height of my camp, which was pitched beneath an immense projecting granite rock, was 12,807 feet. We left the last cluster of birch trees three miles behind us, and, therefore, had to send back that distance for firewood. The thermometer was 38° at night, and water froze hard.

Next day, October 2, we pitched our tent on the crest of the pass, 15,095 feet above the level of the sea. The road was of the worst description, crossing the Pubur, which has its source near this, by an arch of snow of some extent, and then leading over huge detached masses of granite, hurled from the peaks above, and piled upon one another in the

* Called also Boorendo and Supunee.

utmost disorder, with here and there some snow. The ascent was steep the whole way, and almost the only vegetation we noticed was grass in small tufts, which grew more scanty as we advanced to the pass, where it almost disappeared; above, it was still seen, thinly scattered, and interspersed with a few mosses. Here I met my brother James, who had left Soobathoo sometime before me, and had travelled by a much more circuitous route. We sent most of our servants down about five miles, to a more genial climate, where wood was procurable, and remained ourselves at the top. The peaks immediately on either side of us were not more than 1000 feet above us, but there were several not very far distant, which we could not then see, 18,000 feet high. We were lucky in getting the altitudes and bearings of the principal mountains across the Sutluj, which rear their white heads to the height of 20,000 feet and upwards. The thermometer, in a tent, got up as high as 50° during the day, but, at 4h. P.M., it fell to the freezing-point, and at 7h. it was 8° below it. We sat up till past 10, for the purpose of making astronomical observations, which in such a temperature was rather an uncomfortable occupation, and our situation, indeed, in other respects, was none of the most agreeable, for we had but a scanty supply of firewood, which, when kindled in the middle of the tent, involved us in smoke, and we were somewhat incommoded by having to share our shelter, such as it was, with our servants, whilst every now and then we were alarmed by the crash of rocks split asunder by the frost.

We had all severe headaches during the night,

owing probably to the rarefaction of the air, but attributed by the natives to a poisonous plant said to grow most abundantly at the greatest elevations.

This pass is in lat. 31° 23′ and long. 78° 12′. It separates Choara from Koonawur, another of the great divisions of Busehur, which lies on both banks of the Sutluj, extending from lat. 31° 30′ to 32° N. and from long. 77° 53′ to 78° 46′ E. It is a secluded, rugged, and barren country, seldom exceeding eight miles in breadth. It was tributary to, but never conquered by the Goorkas.

On the 3d October, the thermometer was 15° below the freezing-point, and the cold intolerable; we, therefore, waited till two hours after sunrise and then proceeded to the village of Brooang, distant eight miles and a half.

The road lay over a thick snow-bed for the first mile, and then led through extensive woods of various sorts of trees, amongst which we recognized the hazel, plane, horse-chestnut, &c. It was often rugged and rocky, and a steep descent of 7,600 feet perpendicular height. On our way down we found black currants and raspberries in the greatest perfection, of which we preserved a large quantity, and on our arrival at camp we feasted on grapes. Brooang is a small village in Tookpa, one of the divisions of Koonawur, under the Wuzeer Teekumdas. It is situated near the Buspa River, and about two miles from the left bank of the Sutluj.

October 4. Marched to Pooaree, a distance of twelve miles and a half; the road was extremely bad, lying often upon the face of a naked rock, in-

clined to the horizon at a considerable angle, with a precipice of many hundred feet on the outer side. It was no great ascent or descent, but so much caution was necessary to prevent one from slipping off the rocks into the river Sutluj, which lay close upon our left, that the journey took us up twelve hours. To-day we crossed the Buspa, a large stream forty-two feet broad, whose source is six marches to the S.E. of Brooang.

October 5. Proceeded to Rispe, a march of thirteen miles and a half, likewise occupying us the whole day. The road, which lay through thin forests of pine, was not so dangerous as yesterday's, but consisted of several steep ascents and descents of 2,000 feet each, upon rocks of crumbling granite. We had a grand view of the Kylas or Ruldung mountains, from the large town of Reedung or Ribe, about three miles and a half before we reached camp; some idea of it may be formed by imagining an assemblage of pointed peaks, presenting a vast surface of snow, viewed under an angle of twenty-seven degrees, and at a distance of not more than five miles in a direct line. The height of our station was 8,000 feet, and the Kylas peaks were 12,000 higher.

At Rispe we first saw Lamas. Near this place we passed several tumuli from ten to forty feet in length, two broad, and about four high; they are constructed of loose stones without cement, and upon their tops are numerous pieces of slate of all shapes and sizes carved with strange characters. They are called Mane, and are erected over the graves of the Lamas; there are invariably roads on

each side of them, and the natives from some superstitious custom always leave them on the right hand, and will rather make a circuit of half a mile, than pass them on the wrong side.

October 6. Marched to Murung, five miles. The road was pretty good along the left bank of the Sutluj, crossing a river named Teedoong, whose source is in the Chinese dominions; four days journey to the eastward. Murung is a Lama town of considerable size, consisting of seven or eight distinct divisions, and beautifully situated chiefly upon a southern exposure, in a glen, which forms the greater part of an ellipse, through which runs a transparent stream, and upon the banks of it are extensive vineyards and orchards abundantly supplied with water by numerous rills. The dell is encircled by lofty mountains at an angle of twenty-five degrees, on every side except to the westward, where it is open towards the Sutluj, on the banks of which is a small fort. The situation is extremely fine, and the approach to it highly picturesque, leading along a small canal, and through an avenue of apricot trees. Near this place there are a great many piles of stones with inscriptions, and afterwards we met with them almost at every village, until we reached Pangee on our return. We also saw a number of temples called Chosten, which are likewise found in the vicinity of every Lama habitation: they consist of an enclosure formed of three walls with a roof, and open in front. In the inside of these are one or more small white-washed buildings, shaped like urns.

It was our intention to have proceeded further,

but the people told us the next village was at such a distance, and the ascent so fatiguing, with no water on the way, that we could not possibly reach it that night.

October 7. Marched to Nisung, eight miles and a half. The road commenced with a very tiresome ascent of 5,300 feet; here we were delighted to find numerous beds of juniper, and some gooseberries, which were the first we had seen for a long period of years. We were in great hopes we should have met with heath, but saw none. At the top of Toongrung pass, 13,739 feet high, it began to snow, and the thermometer was below the freezing point, so we were glad to make the best of our way down; the foot-path was good, but a steep descent, through juniper and thyme of many kinds, to Nisung, a small Lama village, situate near the Taglakhar, a large stream, which rises in Chinese Tartary, three or four marches to the eastward. The extreme height of this village by corresponding barometrical observations is 10,165 feet, and grapes do not ripen here. We saw several gardens of fine large turnips, fenced around with hedges of gooseberries; the latter are of the red sort, small and extremely acid, but make a capital tart.

October 8. We were delayed till 2 P.M. in order to get grain ground for the consumption of our people, there being no village at the next stage. We only marched one mile and three quarters; the road at first was a descent to the Taglakhar, and then a steep ascent of 2,000 feet; most part of the way up a slope of forty degrees, and

over rugged rocks: we were obliged to halt here, there being no water for many miles in advance.

October 9. Marched ten miles to the bed of a mountain torrent, and did not arrive till an hour after dark. This day's journey was one of the most tiresome we had experienced, crossing two mountains of 12,000 and 13,000 feet. The ascents and descents, one of which was full 4,000 feet in perpendicular height, were steeper for a long continuance than any we had yet seen, and the path was strewed with broken slate, which gave way under the feet. Neither tent nor baggage arrived, and we had nothing but cakes of very coarse meal, which hunger, however, made palatable; upon this kind of food, together with a few partridges, which our people occasionally shot, and without either plates, knives, or forks, we lived for five days. We should have afforded an amusing spectacle, seated upon blankets with long beards, near a fire in the open air, surrounded by our servants dissecting the partridges with the Kookree or short sword worn by the Goorkalees, and smoking plain tobacco out of a pipe little better than what is used by the lowest classes; novelty, however, has its charms, and our being in a country hitherto untrodden by an European, gave us a delight amidst our most toilsome marches, scarcely to be imagined by a person who has never been in the same situation.

October 10. Marched to Dabling, six miles and three quarters. The road was pretty good, lying near the river. We went a little out of the direct

way to visit the Namptoo Sango, a wooden bridge across the Sutluj. The river was here 106 feet broad, and the bridge seventy-eight feet above the stream, which rushed with rapid violence between perpendicular rocks of granite. We in vain tried to measure its depth, and although we had a heaving lead for the purpose of no less than ten pounds weight, we could not effect it. We had practised throwing it in the way they do at sea, by swinging it round the head, and flattered ourselves we were almost as expert at the business as the leadsman on board a pilot schooner, but the force of the current was so great as to sweep it down long ere it reached the bottom. We found the bed of the river 8,200 feet above the sea.

October 11. Marched to Numgeea, nine miles. The foot-path was good and even, upon the bank of the Sutluj. To-day we left the road, to look at the conflux of the Lee with the Sutluj.

The Lee is a river of considerable breadth, coming from Ludak on the northward, but it is not very deep, and flows in a clear stream with a moderate current, whilst the Sutluj is muddy and runs with great velocity, and a stunning noise. Since leaving Pooaree the trees had gradually become more scanty. In the vicinity of Numgeea there is little vegetation, the grass and thyme are but thinly scattered in small tufts, and a solitary dwarf pine appears here and there.

October 12. Marched to Shipke, nine miles. The road ascended a little, and then there was a steep descent into the bed of the Oopsung. Here the rocks were more rugged than any we had yet

seen: they were rent in every direction, piled upon one another in wild disorder, in a most extraordinary manner not to be described, overhanging the path and threatening destruction to the traveller.

From the Oopsung the road was a tiresome and rocky ascent, to the pass which separates Koonawur from the Chinese dominions, 13,518 feet above the level of the sea. Here the scene was entirely changed, a more marked difference can scarcely exist. The mountains to the eastward were quite of another nature from those we had before met with. They are of granite broken into gravel, forming regular slopes, and neither abrupt nor rocky. The country in that direction has a most desolate and dreary aspect, not a single tree or blade of green grass was distinguishable for near thirty miles, the ground being covered with a very prickly plant which greatly resembled furze in its withered state. This shrub was almost black, seeming as if burnt, and the leaves were so much parched from the arid wind of Tartary, that they might be ground to powder by rubbing them between the hands. The brownish tint of the furze, together with the bleakness of the country, have the appearance of an extensive heath, and would strongly remind a Scotch highlander of his native land. Our course from Brooang was about N.E., here we found we had reached the northernmost point of the Sutluj in lat. 31°. 50′. It lay about two miles on our left hand, and from this place, its direction, all the way to the source in the celebrated lake of Mansurowur, is nearly E.S.E. The wind was so strong that we could with difficulty keep

our feet, and it is said to blow with almost equal violence throughout the year. We saw some snow on our right a little below us, and beyond it a peak above 20,000 feet high, off which the snow was drifting in showers from the force of the wind. From the pass to camp the road was a moderate descent upon gravel, winding very much.

Shipke is a large village in the small district of Rongzhoong, under the Deba or Governor of Chubrung, a town, or rather collection of tents, on the left bank of the Sutluj, eight marches to the eastward. The houses here, which are very much scattered, are built of stone and flat-roofed; there are gardens before each, hedged with gooseberries, which gives them a neat appearance. It is a populous place: we counted upwards of eighty men who, on our arrival, came to meet us, being the first Europeans they had ever seen. The Tartars pleased us much, having none of that ferocity of character so commonly ascribed to them; they have something of the Chinese features, and their eyes are small; they all go bare-headed even in the coldest weather, and have their hair plaited into a number of folds, ending in a tail, which reaches to the small of their backs. Their dress consists of a garment of blanket, trowsers of striped woollen stuff resembling tartan, and stockings or boots of red blanket, to which are sewed leather shoes. Most wear necklaces, upon which are strung pieces of quartz or bone; they have also knives in brass or silver cases, and all carry iron pipes of the same shape as those used by labourers at home; and the higher classes have them generally ornamented with silver. In

common with the inhabitants of Koonawur, the greater part of them have a flint and steel for striking fire, attached to their apparel by a metal chain. The women, whose dress resembles that of the men, were literally groaning under a load of ornaments, which are mostly of iron or brass, inlaid with silver or tin, and beads round their necks, wrists, and ankles, and affixed to almost every part of their clothes.

October 13. Halted. My brother took a walk of about a mile towards Keookh with the perambulator and pocket compass, for we did not think it advisable to use the theodolite in the presence of the inhabitants, knowing their extreme jealousy; he had proceeded but a little way from the village before he was perceived, when immediately the people despatched a couple of horsemen after him, and crowded round the tent making a great uproar. My brother had began to return before the horsemen overtook him; they told him they had come to bring him back, but seemed in perfect good-humour, laughing whilst they spoke; they insisted upon his going before them, and would not dismount when he bid them.

About 9 o'clock, the Chinese officers, of whom there are several to regulate the affairs of the country, brought sixteen sers of flour, which they requested us to receive as a present, and it was no unacceptable one, for our people had had but little food for the last three days. In the forenoon, the principal officer shewed us a long piece of parchment, written in what we supposed the Chinese character, and gave us to understand it was an

express order from the Garpan of Garoo, under whose authority the Debas are, prohibiting strangers from entering the country: he, at the same time, said we had so many people with us, (having nearly 100,) that he could not oppose our progress, but it would cost him his head if he gave us the means of going on, so he would not supply us with provisions, which was the most effectual mode he could have adopted to stop us.

During the time we were at Shipke it blew a complete hurricane, and the aridity of the wind dried up every thing exposed to it. The boards of our books were more bent than I ever remember to have seen them in the hot winds, and no dew was observed.

The latitude of Shipke by meridian altitudes of 6 N. and S. stars is 31° 48′ N. and the longitude 78° 48′ E. Its extreme height is 10,597 feet above the sea, and the thermometer ranged from 38° to 60°.

The people are affable and good-natured, and allowed us to handle their pipes, knives, &c. They thronged round our tent from morning till night, and we found it the most difficult thing to understand them, even with the aid of interpreters. The Koonawur words we had picked up, which were of the utmost use to us during our journey, were not intelligible to the people here. This evening the articles that had been so long in the rear came up.

October 14, at sunrise, when the thermometer was 38°, and before the inhabitants had risen, I set up the theodolite, and took the bearings and alti-

tudes of the remarkable peaks; one of them covered with snow, above 20,000 feet in height, is only four miles from the village from which it subtends an angle of 28°; another, called Tuzheegung, 22,488 feet high, to the north of the Sutluj, was seen under an angle of 23° 31′. These elevations were observed with the sextant and artificial horizon.

We exchanged a gilt button for a goat, which we took with us to Soobathoo. The wool is extremely fine and almost equal to what is used for the manufacture of shawls.

We were informed the best was procured farther to the eastward, near Garoo, which is the famous mart for wool. The goat scarcely differs from the common one; and it does not appear to be a distinct breed that produces the shawl wool, but its fineness seems to depend almost entirely upon the elevation and coldness of the climate; we ourselves had an opportunity of seeing this. At Soobathoo, 4,205 feet above the sea, the wool is little better than in the plains of Hindoostan, but it gradually grows finer as you ascend, and in Koonawur, where the villages are more than 8,000 feet high, it is fit for making coarse shawls.

Garoo or Gartop, by the accounts of fifteen different people, is reckoned eleven marches from Shipke; and the road, consisting of gentle swellings, is described as being so good that the trade is carried on by yaks.

After breakfast we returned to Numgeea by the same road as before, and on the 15th October struck off to the N.W. towards Ludak, crossing the

Sutluj a mile from the village, by a crazy bridge constructed of ropes made of the bark of a tree, with basket-work of twigs, forming a curve, almost the sixth part of a circle.

The breadth of the river was seventy-four feet, with a large rock in the middle occupying forty-two feet. The extreme height of the bed is 8,600 feet. This day we travelled seven miles and a half; passing over a mountain of 13,186 feet, the ascent to which was very steep, upon rugged rocks, and above 4,500 feet. We encamped near a stream at the height of 12,800 feet, and had but a small supply of firewood, the country producing nothing but the prickly bush before mentioned, and another not unlike broom.

October 16. Seeing high mountains to the eastward which appeared to be practicable, and thinking the distance short, we resolved to attempt them, whilst our baggage proceeded direct to Nako, only about three miles from our camp. We accordingly set off after an early breakfast, and went up the face of a steep hill for a mile and a half, sometimes over large misshapen masses of granite, sometimes upon a gravelly soil covered with brown furze, and various kinds of aromatic shrubs. There was not the least trace of a footpath, and the prickly bushes impeded us not a little, every moment running into the feet through the shoes, which were of the kind used by the natives; our own stock, from the badness of the road, having been long since worn out. The height of this station was 14,900 feet. There being another higher peak in front without snow, that seemed near, we moved towards it, but were

never so much deceived in distance. It took us full three hours to reach its top, and the ascent was very tiresome, lying over enormous detached blocks of stone, often resting upon small bases, shaking under the feet, and seeming ready to overwhelm us. The last 200 yards were still worse, and we were obliged to use both hands and feet, now climbing up almost perpendicular rocks, and now leaping from one to the other; a single false step might have been attended with fatal consequences, and we were so much exhausted and had such severe head-aches, that we had hardly strength sufficient to make the effort, and it required no inconsiderable one, to clear the deep chasms, which we could scarcely view without shuddering. I never saw such a horrid-looking place; it seemed the wreck of some towering peak, burst asunder by severe frost. After much delay, we got up the theodolite and a couple of barometers at 4 P.M. The mercury stood at 16.170 inches, and the thermometer was 29°, which, compared with corresponding observations made at Soobathoo, gives the height 16,921 feet. We observed all the surrounding peaks, and then proceeded to the village of Nako at a quick pace; the road for the first mile was a steep rocky descent, afterwards a more gradual one to camp, where we arrived at dusk. The distance by perambulator was ten miles and a half, but we must have travelled upwards of eleven, for the wheel could not be rolled to the top of the highest peak.

October 17. From what we saw yesterday, we were convinced we could reach a more elevated spot, and thinking the attainment of a great height

more desirable than a high latitude, we resolved to try it again, and rather defer our intended journey towards Ludak than let slip such a favourable opportunity. From our experience of the slowness with which the perambulator could be rolled over the large stones, we sent it, together with the large theodolite, a-head, at 8 A.M., and moved ourselves at ten. The road at first was tolerably good, lying upon turf, and passing some lakes which were frozen over; latterly it was rocky and the ascent fatiguing, but not near so difficult as yesterday's We stopped several times to look out for our people, but not seeing any sign of them, we dispatched a man to Nako with orders to bring our bed-clothes, a bundle of firewood, and some food to meet us, whilst we proceeded on to a kind of break between two peaks. The last half mile was generally over snow, and both my brother and I felt completely debilitated, and were inclined to return more than once; we were affected with severe headaches and pains in the ears. The highest vegetation we saw, was a plant with leaves like sage, but without smell, and brown from the dryness of the atmosphere. It grows to the height of 17,000 feet, beyond which elevation we found no soil.

At the top of our station between the peaks, where we arrived at 4 P.M., the barometer showed 15.075 inches, which gives the height 18,683 feet. The thermometer, when first taken out of the case, was 30°, but in less than a quarter of an hour it fell to 22° below the freezing point, and the cold was almost insupportable. After taking a few bearings with all possible haste, we set out on our return,

and at dark met our servants with our bed-clothes about a mile and a half from Nako, and halted for the night at the height of 13,724 feet without a tent. Our people had brought wood, but no flint to strike a light; we therefore sent them back to the village for some fire, and it was past eleven before they returned; and during the interval, near five hours, we sat shivering, for the thermometer was 6° below the freezing point, and we had only a blanket each to wrap round us. After we had lighted a fire, we made a large quantity of punch, which we continued drinking till near two in the morning, and I do not recollect any thing that ever refreshed me so much. The length of our march to-day was about ten miles; and we ascended 6,800 and descended 5,000 feet of perpendicular height. The people with the perambulator and theodolite missed the way, and did not arrive till midnight, and their hands and feet were almost frozen.

October 18. The thermometer at sunrise was 16°, and the cold intense; we could not sleep much, owing to it, for excepting a few sticks which we kept for the purpose of preparing breakfast, our firewood was exhausted.

We wished much to see the barometer below fifteen inches, and determined to make another attempt to reach the summit of a peak north of our yesterday's station, which appeared 600 or 700 feet higher. Being now a mile and a half nearer to it than before, we had every hope of succeeding, so sent off the articles we required there, as soon as we could prevail upon our people to move, which

was not, however, before 9 o'clock. We were well equipped with instruments for making all requisite observations, having three barometers, two thermometers, a large theodolite and a small one, a perambulator, a telescope magnifying eighty times, and a smaller one, together with a bundle of sticks to try the boiling water, and a sextant and artificial horizon. We marched a little after ten A.M., and overtook our people not a mile from our halting place. We had infinite trouble in getting them to go on, and were obliged to keep calling out to them the whole way, at one time threatening, and at another coaxing them; to tell the truth, however, we could not have walked much faster ourselves, for we felt a fulness in the head, and experienced a a general debility which, together with headaches and pains in the ears and breast, affected us more than the day before. A cold wind, that benumbed our hands, sprung up, and increased with our height till about 3 P.M., when it died away. After much annoyance we reached the place where we put up the barometer, yesterday; here the man who carried the bundle of sticks sat down, and said he must die, as he could not proceed a step farther, and neither threats nor the promise of a handsome reward could induce him to move. We accordingly left him, and after an ascent of 700 feet attained the top of the peak, 19,411 feet above the level of the sea. The road latterly lay over disunited blocks of granite, between which we found large lumps of ice, transparent as crystal. We got up the last ascent without much difficulty, which is somewhat surprising. It was 4 P.M. when we gained the summit,

so we had no time to make half the observations we wished. The thermometer was not below 22°, but from the wind on the way up, our hands were so numbed, that it was not until we had rubbed them for some time that we got the use of them. Whilst I was setting up the large theodolite, James tried three excellent barometers, which we had the satisfaction to see stand exactly at the same point, 14.675 inches.

The Tuzheegung or Purgeool mountain had an elevation of 17°, and was not more than two miles distant. The ink froze, and I had only a broken pencil, with which I could write very slowly. It was twenty minutes to 5 P.M. before we had finished our observations; the thermometer was 11° below the freezing point, and we had 7,000 feet to descend, over bad road, in a distance of six miles. We cautioned our people against delay, and moved downwards as fast as we could walk. We passed the bundle of sticks where it was left, but the man had disappeared, and we next day understood he had reached camp before us. Night overtook us two miles and a half from Nako, and my brother had the misfortune to fall and hurt his leg so much, that we greatly feared he would be obliged to remain where he was until assistance could be obtained from the village. After sitting down for half an hour, he found himself able to proceed at a slow pace, so we moved on and directed our way by the planet Venus, for a short distance: soon after we lost the road, by going too far to the right, and got in amongst a confused jumble of gigantic masses of rock, from which we found it no easy matter to extricate ourselves. We

wandered about amidst them almost as chance directed, for an hour and a half; many of the stones shook under us, and we passed places frightful even in daylight. About nine we espied a light below us, and heard the roaring of the Lee river, which seemed quite close, it being then calm; this made us imagine we had gone beyond the village, but judging from the strange structure of the surrounding mountains, which we could scarcely mistake, we thought it impossible we could have done so, more especially as we had seen no cultivation, and there are a good many fields around Nako; we therefore went on, and arrived at a Lama's temple that we recognised, about a quarter of a mile from camp. We called out, and were answered by some of our people, who came to meet us with a couple of lights. We reached camp at half past 9 P.M., not so much tired as might have been expected. Only four of our servants arrived that night; the rest stopped without firewood at our former halting-place, and came up late next day, having their feet so much swollen by the frost, as to be unable to carry loads during the rest of our journey. The distance to-day was ten miles and a half.

Our last three marches were fraught with accidents; three barometers, a perambulator, and thermometer, were smashed in pieces; and the small theodolite, a very neat instrument by Dollond, divided into single minutes, with a brass stand, was rendered unfit for taking elevations, the nonius having been broken off. We had remaining, a strong perambulator, two large theodolites, a surveying compass, four barometers and as many ther-

mometers, together with a couple of sextants, a reflecting circle, a repeating one, and a chronometer, so that we were still very well supplied with instruments.

We had great reason to be thankful, that during the last three days there was very little wind, and none at all when we visited the highest peaks, for had there been any when the thermometer was so low, it must have chilled us so that we could not have moved; and to have remained at such heights for a night, would have been almost certain death.

October 19. As many of our servants were unable to walk from fatigue and sore feet, we halted.

The village of Nako is situated about a mile to the east of the Lee river, and is the highest we met with during our tour, being not less than 12,005 feet above the sea. It is pretty large, and inhabited by Lama Tartars, rather different in appearance from those at Shipke, and not resembling the Chinese so much. There is more cultivation about it than would be expected, considering its elevation; and the fields, which are chiefly wheat, a kind of pulse, and barley, extend to the height of 13,000 feet, and have stone dykes around them. Yaks are here used in the plough; they are hardy animals, but often vicious. The grain produced, as at most other villages in Koonawur, is insufficient for consumption, and the people subsist by their flocks. There is a pond near this, surrounded by poplar trees, upon which, in winter, the boys amuse themselves by sliding, but they do not know the use of skates. This morning at sunrise the thermometer

was 18° below the freezing point, a shower of snow had fallen upon the adjacent mountains, and every thing indicated the sudden approach of winter; it was now time for us to think of returning, so we decided upon going no further than Shealkhur. We here received a visit from the Wuzeer Loktus, who has charge of Hungrung, one of the subdivisions of Koonawur, containing ten or twelve Tartar villages, which lies on both sides of the Lee river, from Shealkhur to the Sutluj. He came here to collect the revenue, and brought us a couple of Chourees, and some fine purple grapes, from Soongnum.

October 20. Marched to Chango, nine miles. The road was in general good and broad, lying about a mile from the left bank of the Lee River. We found a great deal of red clay at the height of 12,000 feet, and farther up the hills were granite and gneiss. Chango is situated on a pleasant spot between two rivulets, and not far from the Lee.

October 21. Marched to Shealkhur, a fort and village belonging to Busehur, under charge of Loktus. Its distance from Chango is three miles and a half. The road was rocky, upon the left bank of the Lee, until under the village, where we crossed it by a bad wooden bridge. The bed of the river is here 10,000 feet above the sea, and the breadth of the stream ninety-two feet; but it is not nearly so rapid or so deep as the Sutluj.

The first Ludak village was said to be a day's march to the northward, but, as a single fall of snow might have shut the passes, we gave up the idea of visiting it. The Fort of Shealkhur is situated

in lat. 32° N. long. 78° 38′ E. on the confines of Ludak and the Chinese dominions. It is in a ruinous state, but the position is commanding: the village is a poor place.

From Koonawur to Garoo there are three roads; one from Shipke has already been mentioned; another from Shealkhur, not so good as the former, lies through Choomoortee, an elevated country under a Deba, where the people dwell in tents, do not cultivate the ground, but subsist by their flocks. The third road from Nisung crosses part of the Himalaya range, at a pass called Gangtung, which is represented as being extremely difficult; it is worthy of remark, that the Koonawurees estimate the height of mountains by the difficulty of breathing they experience in ascending them, which, as before noticed, they ascribe to a poisonous plant; but, from all our enquiries, and we made them almost at every village, we could find nobody that had ever seen the plant, and from our own experience we are inclined to attribute the effect to the rarefaction of the atmosphere, since we felt the like sensation at heights where there were no vegetable productions. The traders who cross Gungtung Pass put on so many clothes to defend themselves from the excessive cold, that they can scarcely walk. They wear a large garment with sleeves, reaching almost to the feet, made of sheepskin, with the woolly side inwards; trowsers and stockings of the same material; a kind of rude glove, of very thick woollen stuff, and caps and shoes of blanket; they likewise occasionally wrap three or four blankets round them, and thus accoutred set out on their perilous jour-

ney. No herbage is met with on the way for two days, and travellers are said to have dreadful headaches and pains in the ears, even when at rest. Many goats and sheep die annually, and it is no uncommon thing for the people that attend them, who also sometimes perish, to lose their fingers and toes. This road leads past Chubrung, and crosses the Sutluj at Chuksum Sango, a wooden bridge with a railing of iron chains, under Tooling, a large collection of tents, where there is a temple with a gilt cupola roof, held in great repute amongst the Lamas.

Leh, or Leo, the capital of Ludak, on the right bank of the Indus, is reckoned sixteen days' journey from Shealkhur; there are several roads to it from Koonawur: one from Wangpo, another from Soongnum, and two from Shealkhur. They are rocky at first, but afterwards improve. Leo is about midway between Kashmer and Garoo, being eighteen marches from either.

October 22. Proceeded to Lee, a village on the right bank of the Lee River, near the junction of a small stream with it.

The distance is twelve miles, and as it was late when we started, we did not reach it until upwards of an hour after dark, and half our baggage did not arrive that night. The road was bad crossing two rivulets, the ascent from the latter of which was extremely tedious and dangerous, being very steep, upon sand and gravel, that seemed to have but recently fallen; it was a natural slope, and the greatest caution was requisite to avoid putting the loose earth in motion, for there were no marks of

a foot-path. With all our care, however, it was not unfrequent to slip back many yards, and sometimes near 100 feet of sand gave way at once, carrying the traveller with it, but not very quickly; the greatest danger arose from stones displaced by our people who were a-head, which every now and then whirled past us with astonishing rapidity.

October 23. Marched seven and a quarter miles to Hango, situated on the bank of a stream flowing to the eastward and joining its waters with the Lee. This valley contains five or six villages, around which there is more cultivation than we had often seen in Koonawur. The road commenced with a steep ascent of 2,500 feet, and was then good and even to Hango, 11,468 feet above the sea.

October 24. Marched to Soongnum, 9¼ miles. At first we had an ascent of 3,400 feet, by a good, but steep road, to the top of Hungrung Pass, 14,837 feet in height. This pass separates Hungrung from another of the divisions of Koonawur named Shoo-ung, under the Wuzeer Budreedas. The mountains immediately on either side might be fully 1000 feet above us, but there was little snow upon them, and none at all in the pass itself. The wind blew with irresistible violence, and, although the thermometer was 4° above the freezing point, it chilled us so much that the numbedness of our hands continued almost till we reached camp, to which we descended by a good broad road cut into long zig-zags, and crossed by some rivulets entirely frozen. Soongnum is a town of considerable extent and beauty. It is situated on the point under which the Dar-

boong-Loongpa and Bonkeeo unite; the former is a stream of some size and comes from the N. W.; the latter is small, and has its source near Hungrung Pass.

The dell through which the Darboong flows is broad and level, and almost an entire sheet of cultivation for about three miles. It is a beautiful spot, and the extensive vineyards and number of apricot trees have a fine effect. It is shut into the north and south by mountains not under 14,000 feet; to the N.W. is a steep and high pass to Ludak, and on the eastward lies the Sutluj, which the Darboong joins under the village of Sheasoo, four or five miles further down the glen.

The inhabitants of Soongnum are chiefly Lamas, and its extreme height is 9,340 feet. Trees to which we had been strangers since we left Numgeea, began to appear in this vicinity, at first stunted and thinly scattered upon the surrounding mountains. They consisted of Keloo or Kelmung, and Ree, both varieties of the pine; the last kind produces the Neoza almond, in shape resembling the pistachio, and in taste not inferior to it, it is peculiar to Koonawur, and does not grow to the westward of the Buspa or Wangpo rivers.

In the evening we were entertained with a Lama concert, which was far from disagreeable; the music was high and low alternately, one set singing the bass, and another the treble.

October 25. After crossing the Darboong by a good Sango, we marched to Lubrung, a distance of ten miles and a half. The road was good, winding very much, and crossing the Roonung

pass 14,508 feet high, at the top of which the wind was as strong and as cold as yesterday. We found a great deal of juniper on the way, and the berries were large and well tasted, having little bitterness. Lubrung is a considerable village upon the right bank of the Zong rivulet, a couple of miles from the Sutluj, and 9,296 feet above the sea: opposite to it, and a mile distant, is the populous town of Kanum, where Loktus resides during winter.

There are two brothers named Bullee Ram and Busunt Ram, but they are both generally called Loktus, which word properly speaking should be applied to their house, a building of great extent.

October 26. Marched to Leepe, six miles and a half. The road was bad, lying upon sharp rocks, with moderate ascents and descents. The houses here as well as at Lubrung are wholly composed of wood; they are small, and in shape exactly resemble cisterns. Leepe consists of an upper and lower division, both of which contain a good many inhabitants. It lies upon the left bank of the Tetee, a large stream having its source amongst snow, twelve or fifteen miles to the N.W.; the vineyards are numerous, and the grapes large and of a delicious flavour.

October 27. Marched to Akpa, ten miles and three quarters. The road was rocky, passing the village of Jangee, and for the last four miles led through forests of pine upon the right bank of the Sutluj, about a mile from the stream.

October 28. Proceeded to Pangee, ten miles

and three quarters. The footpath was rugged in the extreme, lying a great part of the way upon fragments of granite and gneiss, which appeared to have but lately fallen, and exhibited a heap of gigantic ruins, amongst which we saw many a noble pine lying prostrate, whilst a few with their branches broken off and otherwise disfigured, just barely peeped above the stones. Large portions of rock fall yearly, and their effects are truly dreadful; they sweep every thing with them, and sometimes stop the channels of the largest rivers for weeks.

From Leepe to this place there is a direct road, not exceeding fourteen miles, but we chose to go round by the Sutluj in order to have a better view of the Kylas peaks.

October 29. Marched to Rogee, nine miles. The road was first a very steep descent of 1,000 feet, to the Mulgoon, a large stream descending at a considerable angle, rushing over rocks with rapid force, and forming a series of cascades. We crossed it by a couple of Sangos, the current being divided into two. The ascent from it was fatiguing for a mile; the road then for the next five miles was excellent, being broad, and leading upon soil through woods of pine, some of which attain a large size, but not quite equal to those near Brooang, one of which measured thirty-three feet in circumference. The last one mile and a half were of an extraordinary nature, along the brink of a tremendous precipice, and often upon unsteady scaffolding that has been constructed with very great labour: this continues for several hundred

yards together, and is formed of spars driven into the crevices of perpendicular faces of rock, with the other ends resting upon trees or posts, and boards across. Now and then you meet with a rude stair of wood and stone, which must have required much trouble to erect; the crags project above the path, and the traveller is frequently obliged to stoop in order to avoid them, whilst at the same time he must pay equal attention to his footing.

Part of the road was destroyed last rainy season, and had not upwards of twenty people been early sent off to repair it, we should have been forced to go by the Sutluj, which is nearly a whole march round. By the time we arrived at the place that had given way, they had made several clumsy wooden ladders, which answered our purpose tolerably well. The mountains latterly on either side of the river are craggy, and rent in every direction, almost destitute of soil, and thinly wooded, but in the vicinity of Kushbeer, which we passed half way, the ground slopes gradually to the Sutluj at some distance, and is thickly studded with hamlets and adorned with vineyards.

At Rogee we saw many orchards containing apples of an excellent kind, nearly as large as those brought from Kabool, which they far excel in flavour.

October 30. Proceeded to Meroo, eight miles and a half. The road was very uneven, upon angular pieces of quartz, gneiss and granite, and often bordering upon or skirting a precipice, about a

mile from the Sutluj, here called Sumudrung. The rocks on our right-hand were of the same cracked appearance as yesterday, frequently overhanging the footpath, and menacing destruction: to the left towards the river the declivity is more gentle, and generally clothed with pines, except where they have been buried amongst rocks dislodged from above.

Meeroo is situated in the district of Rasgramee, and is 8,550 feet high.

October 31. Marched seven miles and three quarters, and encamped near a cave close on the right bank of the Sutluj. The path-way was indifferent, ascending and descending alternately upon the precipitous side of a mountain, and passing the village of Chegaon or Tholang, pleasantly situated near a stream five miles from Meeroo. Half a mile on this side of it, the road led through an arch formed of two stupendous rocks of granite which meet at an angle.

November 1. Marched to Nachar, eight miles. The way was rough for four miles, to the Wangpo, a large mountain torrent that rushes down a steep declivity, forming a succession of waterfalls in its course, and dashing against the huge masses of rock in its bed with a noise like thunder, throwing up the spray to an amazing height. We crossed it by a good Sango, and proceeded half a mile upon level ground to Wangtoo Jhoola, a rope bridge over the Sutluj.

Near it are the remains of a wooden bridge, such as is described in Captain Turner's narrative, which was destroyed on the Goorka invasion of Busehur.

We found the breadth of the Sutluj, at the bridge, eighty-eight feet, and the height of its bed 5,200 feet. In some parts it is scarcely 50 feet broad, and it was in attempting to swim over at a narrow place, that one of my servants was drowned here last year. After much delay we got every thing across without an accident, and ascended for three miles and a half to Nachar, where there are a few grapes, which seldom ripen. The cold does not depend nearly so much upon the absolute height of the place, as its elevation above the bed of a river, for vines come to maturity upon the banks of large streams, 9,500 feet from the level of the sea, and Nachar does not exceed 7,000 feet in height.

November 2. Proceeded eight miles to Turanda in Utharabees, and three miles from the western limit of Koonawur. This day's march was beautiful, for the first three miles and a half upon soil, and through shady groves of lofty pines from twenty to twenty-seven feet in circumference; the road then was a rocky descent of one mile and a half to the Syldung, a tremendous torrent dashing over large stones, and coming from the Himalaya mountains to the southward: we crossed it above the union of two streams, by a couple of bad sangos, and ascended from its bed by a rocky footpath, winding amongst extensive forests of oak, yew, pine, and horse-chestnut, to camp.

November 3. Were detained by a heavy fall of snow and hail, which lay around us in large quantities, and many hundred feet below the village. Had this shower come on ten days ago, we should have

been prevented from crossing the passes near Soongnum, which, together with those above 13,000 feet, are blocked up for four months in winter.

November 4. Marched to Soorahun, 13 miles. It took us almost the whole day to perform the journey, for the path, which is at all times dangerous, from lying near a precipice upon smooth stones, by the late shower of snow now frozen hard, had become so slippery, that we could get on very slowly. We crossed four streams of some size, besides many smaller ones; they were all rapid, but of no great depth.

The mountains near this are heavily wooded to their summits; the cultivation increases at every step, and the villages are more thickly scattered.

Soorahun is 7,248 feet above the sea, in Dusow, one of the large divisions of Busehur. It is the summer residence of the Rajah and most of his Wuzeers, who stay here six or seven months in the year to avoid the great heats at Rampoor; it contains several good houses, and a temple attended by Brahmins.

November 5. Marched to Dhar, 9½ miles. The road was bad, crossing the Munglad, a rapid torrent, by a rotten Sango, consisting of two fir trees about a foot apart, with small twigs and slates laid across: one of the spars is much lower than the other, and the bridge is both unsteady and unsafe. The descent to the stream was at such a great angle that we frequently slid many feet at a time. The ascent was equally bad, lying upon pure mica, shining with a bright lustre and extremely slippery.

November 6. Marched to Rampoor, distant 8¼

miles. The road was sometimes rugged, but more commonly even; part of the way it was a complete swamp, lying through rice fields intersected by many rills.

Rampoor is situate in lat. 31° 27′ N. and long. 77° 42′ E. on the left bank of the Sutroodra, or Sutluj.

We found the bed of the river, by barometrical observations, 3,260 feet above the level of the sea.

November 7. Marched to Nirt, upon the left bank of the river; the distance is twelve and a half miles, and the road, for the first four and a half miles, consisted of short rocky ascents and descents to the Nouguree, a large stream coming from the eastward. We crossed it by an excellent high Sango with a railing, and the rest of the way was quite plain, lying near the Sutluj.

The extreme height of the bed of the river opposite to the village is 2,912 feet.

November 8. Marched 8¾ miles to Kotgurh, where there is a cantonment for two companies of the First Nusseeree Battalion. The road, at the beginning of this day's journey, lay close upon the left bank of the Sutluj, and then was a steep ascent of 3,500 feet, latterly winding amongst beautiful woods of oak, pine and yew.

November 10. Proceeded 7¼ miles to Huttoo, in order to make some astronomical observations, and get the bearings and elevations of the surrounding objects. The ascent from Kotgurh is not less than 4,000 feet. The road at first was good, but afterwards steep and rugged. Huttoo consists of two small forts upon the top of a hill 10,600 feet

above the level of the sea, connected on the N. E. with the Snowy Mountains; the prospect from this spot is very extensive; upwards of fifty forts, with from four to six towers each, may be distinctly counted in the Rajships of Kooloo, Sooked, and Mundee, N. W. of the Sutluj; beyond these are seen high mountains covered with eternal snow. To the N. E. and E. the view is bounded by the outer range of the great Himalaya chain, extending until it is lost in the horizon; whilst to the South and S. W., the hills decrease in height to the plains, which are clearly distinguishable at a distance.

We were detained here until the 16th, for we were involved in mist for several days, during which time we could not see half a mile on any side. The thermometer did not get above 34° in a house with a large fire for two snowy days, and at sunrise it was 28° but when the clouds cleared away it rose to 40° and 41° at noon. After completing our observations on the 16th we returned to Kotgurh, where we stayed a couple of days, and on the 19th marched to Jeemoo, nine miles and a half. The road for about four miles was generally good, passing many villages, and lying upon the face of a left-hand range, amongst dark forests of various sorts of trees, to a small stream from whence there was a very steep ascent of 2,400 feet, through a thicket to Nag Kanda pass, 9,000 feet high; we here found a great many hazel trees, but all the nuts were rotten. From the pass to camp, we had a moderate descent of three miles, on the slope of a grassy range that lay upon our right.

November 20. Marched to Muteeana, nine miles. The road for near six miles was good, upon the right bank of a rivulet, and crossed by many brooks to Mandunee, where there is a handsome temple built in the Chinese style. After leaving it we crossed the Kuljehur, a stream coming from the northward, that divides Keoonthul from Koomarsaeen, two small states under chiefs called Ranas. The descent to the Kuljehur was steep, and the ascent to camp equally so, each about 1,000 feet. The mountains we passed were wooded with pines and oaks in the valleys, but above produced little except grass.

November 21. Marched to Bunee fourteen miles and three quarters. The road consisted of easy ascents and descents near the top of a range upon soil, and through a very highly cultivated country abounding in villages, and extremely populous.

On the 22nd November proceeded to Semla eleven miles, and next day made a forced march of twenty-two miles and a half to Soobathoo. The latter part of the road has already been described.

Throughout the above mentioned tour the road was surveyed with some care, and a number of points were fixed trigonometrically, which agree well together. We were very lucky in having clear weather, and always managed to get two, but most commonly three or four meridian altitudes of stars, both north and south, contained in Dr. Pond's catalogue, at every halting-place except one.

We had two sextants, and a Troughton's reflect-

ing circle having a stand, with the last of which instruments the latitudes were usually observed. We carried no less than fourteen excellent barometer tubes with us, only two of which returned in safety: before setting out they were all found to stand at the same point, and the height was always measured from the surface of the mercury.

The altitudes of our stations were calculated, above Soobathoo, by M. Ramond's method, and checked by Roy's in case of a mistake, where the barometer was observed five or six times a day during most part of our absence; and the height of Soobathoo, by the mean of a whole year's barometrical observations, was found to be 4,205 feet above the level of the sea.

At every camp we tried the boiling point of water with two good thermometers, which very seldom indeed gave the altitude 300 feet different from the barometer; and had we arrived at our ground in sufficient time to distil water, I have no doubt that the disagreement would have been much less, for wherever we had an opportunity of using snow, the coincidence of the two methods was most satisfactory. The largest theodolite was constructed by Troughton, and graduated both vertically and horizontally to twenty seconds; and the elevations of most mountains subtending small angles, were taken with it, and those above 10° were observed either with the sextant or circle, and artificial horizon.

The height of the colossal Tuzheegung, whose summit is almost 22,500 feet above the level of the sea, was determined by angles of elevation, varying between 4° and 24°, taken at eight different stations,

from 9,000 to 19,000 feet in height, and from two to about thirty miles distant from it; and allowing one-fifteenth for terrestrial refraction, the extreme difference between any two of the observations does not amount to 250 feet. The Kylas peaks, besides several others, were calculated from many stations, at various distances, and none of them differ above 500 feet from one another. The next highest peak to the Tuzheegung that we saw, is above 21,000 feet. It was seen from Hutoo, fifty-three miles distant, under an angle of 1° 47′, and its altitude, deduced from this, comes within 200 feet of what the observation at Rogee gives it, where the distance was only eight miles, and the elevation 15°.

The mercury was revived from Cinnabar, and was well boiled in the tubes; the last, indeed, was a most tedious business, for we broke above a dozen of tubes in the operation.

The most convincing proof that the air was completely expelled is, that the mercury in tubes of thirty-two and twenty-six and a quarter inches, stood exactly at the same point, although the vacuum in the short one was not more than one-third of an inch, and on applying a candle to the top, the mercury rose a little, whereas; had there been the least air, it must have sunk from the expansion, which would have been clearly perceptible in so small a space.

A. GERARD.

Soobathoo,
August, 1819.

APPENDIX.

TABLE I.

Latitudes observed in the Hills.

Places of Encampment.	Latitudes North.			Remarks.
	°	′	″	
Nahun, Captain Birch's house	30	33	11.7	4 ⊙, and 2 α ♎
Shaee, Buneean's house	31	8	39	Antares and ϵ Scorpii.
Belaspoor, N. end of Town	31	19	44	α Scorpii. Very good obs.
Jugathana S.E.	31	16	40	2 σ Sagittarii, and α Scorpii
Ree, centre of village	31	12	56.5	2 σ Sagittarii
Makowal, near centre of town	31	13	50	⊙. Altair, η Ophiuci, α Ursa minoris.
Chukeean, E. 50 yards	31	6	41	2 ☽ and 2 η Ophiuci
Roopoor fort on hill, N. 35° W. 600 yards. Other fort S. 42° E. 200 yards	30	58	2	α Scorpii, η Ophiuci, 2 σ Sagittarii and 1 ☽
Pulasee fort, S. 73° W. 650 yards	31	2	42	1 σ Sagittarii, and 2 ☽
Nalaghur S.W. 100 yards	31	2	10	1 α Scorpii, 2 λ Scorpii and 2 ☽
Toojar S.E. end of town	30	57	5	1 ϵ Sagittarii, 2 η Ophiucii, and 2 λ Scorpii
Tuxal, Sookehyndghur S. 5° W. 130 yards	30	51	10	2 σ Sagittarii
Deeone	30	54	18	2 ⊙
Rajghur	30	52	50	do.
Mogeenund N. 45° W. 1 furlong	30	30	23	⊙ Tolerable
Syree, Boulee	31	4	29	Fomalhaut & δ Aquarii
Mandunce	31	11	40.1	ζ Sagittarii. Tolerable
Teehree	31	20	32	By equal altitudes of the ⊙
Chuktee	31	20	49.1	β Capricorni. Tolerable
Rampoor	31	26	38.3	δ Aquila β Capricorni, and equal altitudes ⊙
Dhar	31	28	37.3	do. do.
Soorahun	31	30	36.6	δ Aquila, β Capricorni, σ Sagittarii
Chora	31	33	47	δ Aquila, β Capricorni
Turenda	31	33	8.7	2 ⊙
Nachar	31	33	31.7	β Capricorni, good
Wangtoo Jhoola	31	32	20.9	2 ⊙
Chegaon	31	30	53.3	⊙ good
Meeroo	31	31	33	2 ⊙

Places of Encampment.	Latitudes North			Remarks.
	°	′	″	
1½′ West of Rogee....	31	30	22.1	⊙ good
1¼′ S. 80° W. of Pangee	31	35	0.4	do.
Rogee	31	30	23.8	Fomalhaut, and ⊙
Rarung	31	35	42.7	2 ⊙
3′ S.W. of Panung .	31	30	22.2	⊙ tolerable
½′ N. of pass in Snowy Mountains	31	24	9.1	⊙ good
Latitude of Pass.....	31	23	47	Deduced from the above
Rd	31	21	26	⊙ very bad. Cloudy
1½′ N.N.E. of Theontee	31	16	0	⊙ good
Rooroo	31	11	54.4	do.
Kooee	31	14	30.5	do.
2½ N.E. of Reolo.....	31	14	28.3	⊙ tolerable
Hutoo S. fort or Whartoo.....	31	14	25	2 ⊙
Kotgoorh or Kotgurh	31	18	30.4	⊙
Dunan	31	18	3.5	⊙ good
Hutheea	31	16	49.5	do.
Khera	31	14	20.4	⊙ good
Soonee	31	14	15.3	do.
2′ N. E. of Nahra	31	13	12	do.
Urkee fort	31	8	52.1	do.
Huthee.....	31	4	39.2	do.
Soobathoo, my brother's house	30	58	24.5	2 ⊙
Bhoorsghuree Deota ..	30	44	37	⊙ good
Dundor S. 80° W. 1′½	30	35	8.5	do.
Koorla	30	33	31.1	⊙ tolerable
Surmour	30	31	59.4	⊙ good
Danda	30	30	37.7	do.
Bhyla	30	31	59.8	do.
Khunee	30	31	54.7	do.
Jytuk, centre of fort ..	30	35	3.7	5 ⊙
Bunethee Deota	30	37	48.9	
Bunethee Boulee	30	37	10.8	
Soobathoo	30	58	21	4 sets of ⊙ by reflecting circle.
Semla camp	31	6	15.7	α Aquarii, Polaris, and Fomalhaut
Juko	31	5	54.3	2 ⊙ α Aquila, α Aquarii, Fomalhaut, α and β Cephei
Muhasoo	31	5	35.1	2 ⊙
Bunee camp	31	5	15.1	α Aquarii and α Cephei
Pulana	31	6	48.5	⊙, α Aquarii and β Cephei
Pujoul	31	6	42	⊙
Kothkhaee	31	7	4.5	α Cephei and α Aquarii
Gujyndee	31	10	20.2	α and β Cephei.
Puneout pass	31	10	39.3	⊙

Places of Encampment.	Latitudes North.			Remarks.
	°	′	″	
Rooroo	31	11	28	α Aquarii
Cheergaon	31	13	58.2	α Aquarii, α and β Cephei
Pekha	31	14	54.5	do. do. do.
Jangleeg	31	18	37.8	α Ceph. and α Aquarii
Near Moondar	31	20	33.5	⊙
Brooang or Boorendo pass	31	23	8.5	⊙, 5 α Ceph. 5 α Aquarii
Brooang	31	27	55 6	β Ceph. and α Aquarii
Pooaree	31	32	49.5	Do. do.
300 yards S.W. of Poorbunee	31	35	10.8	⊙
Rispe	31	34	52	α and β Cephei and α Aquarii
1 furlong S.E. of Murung camp.....	31	36	20.1	⊙
Nisung	31	38	53.8	⊙ α and β Cephei, and α Aquarii
Camp near Hocho river	31	43	25.5	α and β Cephei
Dabling	31	44	57.7	Ditto, and α Aquarii
Numgeea...	31	48	39.7	do. do.
Shipke	31	48	41.2	2 α Cephei, 2 β Cephei 2 Aquarii, and 1 ⊙
Shipke pass (Peeming)	31	49	28.8	⊙
Camp near river.....	31	50	55.5	α and β Cephei, and α Aquarii
Nako	31	52	46.3	α and β Cephei
1½′ W.N.W. of Chango	31	59	7.7	⊙
Shealkur	31	59	51.8	α and β Cephei, α Aquarii and Fomalhaut
Leeo	31	52	44	α and β Cephei, α Aquarii and ⊙
Hango	31	49	50.7	α & β Cephei, α Aquarii and Fomalhaut
Soongnum	31	45	30.3	α and β Cephei, and α Aquarii
Labrung	31	40	27.1	do. do. do.
Leepe	31	39	11	do. do. do.
Akpa.....	31	34	50.6	α Cephei and α Aquarii
Pangee.....	31	35	6.2	α and β Cephei and α Aquarii
Rogee	31	30	15.6	do. do. do.
Meeroo.....	31	31	39.7	do. do. do.
Rampoor	31	26	22.2	β Cephei and α Aquarii
Kotgoor or Kotgurh ..	31	18	44.2	4 ⊙, 3 Fomalhaut, 3 Polaris, 2 α Aquarii
Hutoo, station 1st	31	14	35.8	3 ⊙, 1 α Cephei, 3 Fomalhaut, and α Aquarii, and 3 Polaris

Places of Encampment.	Latitudes North.			Remarks.
	°	′	″	
Muteeana.....	31	11	26.9	α Aquarii, Fomalhaut and Polaris
Soobathoo	30	58	24	Polaris and Fomalhaut, with Sextant
Ditto	30	58	19.6	7 sets by circle ⊙ and *
Bohor	30	50	43.6	2 sets Polaris, circle
Jogeebun.....	30	30	27.5	2 do. do. do.
Kaseepoor	30	27	53	do. do. do.
Booreea, N. 62°, E. S. 5° E. 100 yards	30	9	33.7	Spica ♍
Bilaspoor, N. 10° E. S. 80° W. 250 yards ..	30	17	42.2	do.
Sidhora Ghuree, S. 9° E. ¼′	30	23	7.7	do.
Nurainghur, S. 44° W. ½′	30	28	45.6	do.
Raeepoor fort, 186° ¼′	30	35	2.6	do.
Ramghur fort, S. 84° E. 300 yards	30	38	31.7	do.
Chundee fort, N. 1 furlong.	30	44	11.8	do.

TABLE II.

Heights by Trigonometry.

Station.	Above the Sea by Barometer.	Place determined.	Distance from Station.	Observed Elevation and Depression.	Above Station.	Below Station.	Height above the Sea.	Mean height above the Sea.	State or District.
				° ' "					
Rampoor	3260	Kandee	11193	20 52 20	4406	,,	7666	7599	Kooloo
Hutoo or Whartoo	10646		81048	2 17 20*	,,	3114	7533		
Hutoo	,,	Chouasee	81840	1 31 55*	,,	2061	8585	8569	Sooked
Kotghur	6642		59494	1 46 30	1911	,,	8553		
Hutoo	,,	Mugroo	116160	0 40 0*	,,	1048	9598	9567	Mundee
Kotghur	,,		94296	1 38 44	2894	,,	9536		
Kotghur	,,	Raghoopoor	86532	2 37 30	4123	,,	10765	10855	Kooloo
Hutoo	,,		111936	0 1 13	300	,,	10946		
Kotghur	,,	Chinjeeala	92277	2 11 4	3698	,,	10340	10393	Mundee
Hutoo	,,		112147	0 16 47*	,,	285	10361		
Soobathoo	4205		191136	1 39 8	6273	,,	10478		
Kotghur	,,	Bugra	105040	1 56 49	3801	,,	10443	10490	Mundee
Hutoo	,,		128673	0 12 7*	,,	109	10537		
Kotghur	,,	Seereeghur	35808	2 42 15	1717	,,	8359	8381	Kooloo
Hutoo	,,		61142	2 10 0*	,,	2242	8404		
Kotghur	,,	Mudunghur	120160	0 33 55	1474	,,	8116		Mundee
Kotghur	,,	Mounag Deota	59603	1 37 21	1761	,,	8403		Sooked
Kotghur	,,	Noonokundee	40901	5 16 22	3813	,,	10455		Kooloo
Kotghur	,,	Ramghur	79246	1 1 14	1541	,,	8183		Sooked
Rampoor	,,	Ramghur	11246	18 6 30	3681	,,	6941		Kooloo
Rampoor	,,	Dhoul	11246	18 43 0	3809	,,	7069		Kooloo
Soobathoo	,,	Juko	78144	2 52 45	3989	,,	8194		Keoonthul
Juko	8194	Hutoo	113362	1 7 31	2490	,,	10684		Sindoch

* Are depressions.

TABLE III.

Heights by Barometrical Observations.

The height of Soobathoo *above* the sea, by the *mean* of one year, is by Ramond's formula 4,208 feet, and by Maskelyne's 4,205 feet. Kotgurh House is *above* Soobathoo by Ramond's formula 2,429 feet, and by Maskelyne's 2,428 feet, by the *mean* of 168 observations.
Those places marked * are below Soobathoo.

The heights along the road from Soobathoo across the Himalaya to Shipke, thence to Shealkur, and back to Theog Camp, have been most carefully arranged in regular series; as also those from Soobathoo to Saharunpoor on the plains of Upper Hindoostan. The column of Differences shews the reliance which may be placed upon Barometrical measurement.

	PLACE.	Above or below the level of Soobathoo.		Above or below the level of Kotgurh House.		Mean height above Soobathoo by corresp. obs. at Soobathoo & Kotgurh, by R.	Number of corresponding Observations.		Difference between the heights by R. with corres. obs. at Soobathoo and Kotgurh H.	Height above the sea, by Ramond.
		R.	M.	R.	M.		Soobathoo.	Kotgurh.		
1	Soobathoo, 4205 feet									
2	Confluence of the Doburnaee and Gumbur Rivers..	1438*	1438*	..	..	..	3	..	..	2767
3	Hureepoor.....	1058*	1058*	..	..	..	3	..	..	3147
4	Mumleeg	309	317	2150*	2150*	294	11	9	30	4499
5	Soohur Debee	1208	1211	..	..	..	1	.	..	5413
6	Syree Pass	878	876	..	..	..	1	.	..	5083
7	Syree Well	512	527	1915*	1914*	513	3	1	2	4718
8	Rutnaon Pass	960	..	1477*	..	956	2	1	8	5161
9	Jantee Debee	772	772	1668*	..	766	2	1	11	4971
10	River under Semla.....	1105	..	1364*	..	1085	2	1	40	5290
11	Kreroo Pass.....	2553	..	..	..	..	2	..	..	6758

12	Kreroo Deota	3040	3037	..	..	..	1	..	..	7245
13	Semla Village	2928	..	..	..	..	1	..	..	7133
14	Semla Camp	3101	3097	638	639	3084	18	5	34	7289
15	Juko Flag-staff	3938	3933	1485	1484	3926	25	12	24	8131
16	Foot of Juko Hill	3283	..	818	..	3265	1	1	36	7470
17	First Pass	3457	..	1010	..	3448	1	1	18	7653
18	Second Pass	3458	..	1004	..	3445	1	1	25	7650
19	Tank near Muhasoo	4088	..	1627	..	4072	1	1	32	8277
20	Muhasoo Flag-staff	4870	..	2446	..	4873	2	1	5	9078
21	Bunee Village	3743	3745	..	..	..	1	..	..	7948
22	„ Camp	3900	..	1476	..	3902	9	7	5	8107
23	Theog Fort	3813	..	1384	..	3813	2	1	..	8018
24	„ Camp	3675	..	1260	..	3682	1	1	14	7887
25	Pulana	1920	..	493*	..	1928	2	8	16	6133
26	Sahlar River	578	..	1794*	..	606	1	1	57	4811
27	First Ascent	944	..	1432*	..	970	1	1	53	5175
28	Camp Poojoul	805	..	1684*	..	775	5	5	60	4980
29	Giree River $\frac{3}{4}$ of a mile N.E. of Poojoul	655	..	1814*	..	635	1	1	40	4840
30	Giree, 2 miles W. of Kotkhaee	978	..	1487*	..	960	1	1	36	5165
31	Camp Kotkhaee	1296	..	1105*	..	1310	3	5	28	5515
32	Ghyldee River 1 and a $\frac{1}{2}$ miles N.E. of Kotkhaee	1654	..	772*	..	1656	1	1	3	5861
33	Khuneoutee near Deeuree	2293	..	134*	..	2294	1	1	2	6499
34	Deeuree Pass	4672	..	2260	..	4680	1	1	17	8885
35	Gujyndee	3122	..	729	..	3140	2	3	36	7345
36	Khud $3\frac{1}{2}$ miles N.E. Gujyndee	1786	..	635*	..	1790	1	1	8	5955
37	River under Puneout Pass	2279	..	..	..	..	1	..	..	6484
38	Puneout Pass	3806	3817	..	..	..	1	..	..	8011
39	River near Rooroo	1334	..	1146*	..	1308	1	1	51	5513

	PLACE.	Above or below the level of Soobathoo.		Above or below the level of Kotgurh House.		Mean height above Soobathoo by corres. obs. at Soobathoo & Kotgurh, by R.	Number of corresponding Observations.		Difference between the heights by R. with corres. obs. at Soobathoo and Kotgurh H.	Height above the sea by Ramond.
		R.	M.	R.	M.		Soobathoo.	Kotgurh.		
40	Rooroo Kothee	956	..	1440*	..	972	7	6	33	5177
41	Cheergaon	1777	..	646*	..	1780	4	7	6	5985
42	Teekree	2581	..	178	..	2594	5	5	26	6799
43	Jutwar in Pekha	3955	..	1560	..	3972	10	9	34	8177
44	Lingwar	4561	..	2118	..	4554	1	1	14	8759
45	Junction of Seepun and Pubur Rivers	4136	..	1733	..	4149	1	1	26	8354
46	Jangleeg	5078	..	2597	..	5052	3	5	52	9257
47	Seven furlongs N.E. of Jangleeg, lowest snow-bed, left bank of Pubur River	5534	..	3142	..	5552	1	1	37	9757
48	1½ miles N.E. Jangleeg	6147	..	3723	..	6149	1	1	5	10354
49	2¾ miles N.E. Jangleeg	6625	..	4199	..	6626	1	1	3	10831
50	4 miles N.E. Jangleeg	6970	..	4546	..	6972	1	1	5	11177
51	First bed of snow, south face of Himalaya	7681	..	5301	..	7705	1	1	49	11910
52	J. G. Gerard's Camp	7721	..	5323	..	7736	1	3	31	11941
53	Moondar Cave	8584	..	6191	..	8602	2	4	36	12807
54	Source of Pubur River	9620	..	7220	..	9634	1	1	29	13839
55	Broang or Boorendo Pass	10864	10830	8487	8458	10890	15	29	52	15095
56	Lowest part of continued bed of old snow on the north face of the Himalaya	9598	..	7233	..	9630	1	1	64	13835

57	Lowest snow on Broang Pass on the north face of the Himalaya, sixty feet below this	6661	..	4250	..	6670	1	1	„18	10875
58	Broang Village	3147	..	836	..	3206	1	1	118	7411
59	Sango across the Buspa River	1763	1762	..	..	..	1	..	..	5968
60	Bed of Sutluj, three quarters of a mile east of the Sango	1741	..	..	..	..	1	..	..	5946
61	Point of road 2¼ miles east of last station	2490	..	..	..	..	1	..	..	6695
62	One furlong south of Pooaree	2450	2447	..	..	..	1	..	..	6655
63	Bed of Sutluj opposite Pooaree	2350	..	..	..	..	1	..	..	6555
64	300 yards S.W. of Poorbunee	3989	3994	..	..	..	1	..	..	8194
65	5½ miles N.E. of Pooaree	5627	5625	..	..	..	1	..	..	9832
66	Reedung	3849	3844	..	..	..	1	..	..	8054
67	Rispe	3841	3836	..	..	..	1	..	..	8046
68	Teedoong Sango	3388	3387	..	..	..	1	..	..	7593
69	50 feet above river, south of Murung	4105	..	..	..	..	3	..	..	8310
70	Murung Camp	4298	4297	..	..	..	3	..	..	8503
71	First Pass	8797	8765	..	..	..	1	..	..	13002
72	Toongrung Pass	9534	9509	..	..	..	1	..	..	13739
73	Lowest Snow N. face of Pass, 7 Oct.	7631	..	..	..	..	1	..	..	11836
74	Nisung	5960	5943	..	..	..	3	..	..	10165
75	Bed of Taglakhar River	5089	5088	..	..	..	1	..	..	9294
76	Camp	6955	6933	..	..	..	1	..	..	11160
77	Keipoo Pass	9251	9215	..	..	..	1	..	..	13456
78	Highest point of road one mile beyond Keipoo	9367	..	..	..	..	1	..	..	13572
79	Bed of the Thomba River	5162	..	..	..	..	1	..	..	9367
80	Highest point of the road	7616	7600	..	..	..	1	..	..	11821
81	Camp near Hocho	5746	..	..	..	..	1	..	..	9951

	PLACE.	Above or below the level of Soobathoo.		Above or below the level of Kotgurh House.		Mean height above Soobathoo by corresp. obs. at Soobathoo & Kotgurh, by R.	Number of corresponding Observations.		Difference between the heights by R. with corres. obs. at Soobathoo and Kotgurh H.	Height above the sea by Ramond.
		R.	M.	R.	M.		Soobathoo.	Kotgurh.		
82	Bed of the Hocho River	5000	..	..	..	..	1	..	..	9205
83	Poodado Pass	7219	..	..	..	..	1	..	..	11424
84	Namptoo Sango	4093	..	..	..	..	1	..	..	8298
85	Dabling	5185	..	..	..	..	2	..	..	9390
86	1½ Furlongs South of Khab	5105	..	..	..	..	1	..	..	9310
87	3½ Furlongs N.E. of Khab	5471	..	..	..	..	1	..	..	9676
88	Conflux of Lee and Sutluj	4289	..	..	..	..	1	..	..	8494
89	Numgeea lowest camp	5007	..	..	..	..	4	..	..	9212
90	1½ miles N.E. of Numgeea camp	6933	..	..	..	..	1	..	..	11138
91	Oopsung River	6784	..	..	..	..	1	..	..	10989
92	Peeming Pass	9313	9292	..	..	..	2	..	..	13518
93	Shipke	6392	..	..	..	..	5	..	..	10597
94	Sutluj under Numgeea	4399	..	..	..	..	1	..	..	8604
95	Tuzheegung Camp	7648	..	..	..	..	2	..	..	11853
96	Lam Pass	8981	..	..	..	..	1	..	..	13186
97	Taghar River Camp	8609	..	..	..	..	4	..	..	12814
98	1½ miles E.S.E. of Taghar	10717	10684	..	..	..	1	..	..	14922
99	Top of Rock	12716	12660	..	..	..	1	..	..	16921
100	Nako	7809	7625	..	..	..	6	..	..	12014
101	Camp, 1½ miles East of Nako	9519	9486	..	..	..	1	..	..	13724
102	Rock 2¾ miles East of Nako	11355	11309	..	..	..	1	..	..	15560
103	Top of Pass	14478	14204	..	..	..	1	..	..	18683

A
Map of
KOONAWUR,
By
SURVEYOR

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